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General Scientific

OCCUPATIONAL HYGIENE IN THE NAVY.

SURGEON GENERAL CHARLES F. STOKES, U. S. Navy
and
PASSED ASSISTANT SURGEON JOHN L. NEILSON, U. S. Navy,
Washington, D. C.

Hygiene and preventive medicine in the Navy, as elsewhere, is a subject of great importance. In many phases of naval activity there are exactly similar matters to be dealt with as in civil life, but beyond those there are problems which are distinctly dependent upon and directly resulting from the particular conditions and modes of life existing in a highly specialized military establishment. These are found in their greatest intensity on board ship where large bodies of men are gathered together in a limited space, the design of which turns upon the one point of military efficiency, all else being subordinate.

The personnel, which consists of physically and mentally picked men, live amidst complicated mechanical and electrical appliances, in cramped spaces many of which never see the light of day. They are exposed to every variety of weather and sudden change of climate. Their duties are arduous and exacting, and include many vocations in which civilians are engaged and in addition those of a military establishment.

To keep this personnel at a high standard of physical condition, upon which depends largely its efficiency as a fighting machine, is the problem with which the medical officers of the Navy have to deal. It depends upon them to select, in the beginning, as perfect a physical specimen as possible and then prevent any falling away from that standard of perfect health, and to minimize, by preventive and curative measures, loss of time and money to the government by reason of illness or disability.

The scope of this article is such that only a glimpse of the ramifications of these matters can be given. The measures for personal and ship cleanliness; the disposal of wastes; the prophylaxis directed against small-pox, typhoid fever and venereal diseases; the food and water supply; ventilation; exercise; recreation; heating; the care of the eyes—suggest some of the problems that are dealt with.

A study of statistics arranged to show diseases and injuries based upon occupational groups directs us accurately to the weak spots that the hygienist must strengthen. Briefly stated, these may be divided into 5 groups:

1. Affections which depend upon probable predisposition.
2. Affections depending upon environment of recruits.
3. Affections depending upon ship life.
4. Affections depending upon exotic exposure.
5. Special hygienic problems.

1. Affections which depend upon probable predisposition.

The most important condition under this heading is flatfoot, and it presents a perplexing problem, as it involves the initial physical examination, increased service activity and malingering. As is well known, standing for long periods of time without muscular exertion is a common cause of flatfoot, and, given a predisposition, the long hours on watch and on guard duty are favorable to the development of this deformity. Critical and intelligent examination upon entrance and when symptoms are complained of, the issue of properly shaped and fitting shoes, and the inauguration of properly gauged practice marches and special exercises for the feet will largely reduce this invalidism.

2. Affections depending upon the environment of recruits..

These are, chiefly, general infective, skin and venereal diseases and non-venereal diseases of the genito-urinary tract. These troubles which are so prevalent in civil life become occupational in the Navy by reason of the close association of large bodies of men on board ship and in barracks and especially by reason of the fact that they suddenly enter upon an entirely different mode of life from that to which they are accustomed. Close association continues to exist after the recruit has obtained experience and training, and the general occupational element, as compared with civil life, persists, but to a much less degree, as in these groups men have learned better how to take care of themselves and are used to the environment. This is graphically shown in a statistical table of the distribution of diseases among occupational groups within the service which appeared in the Annual Report of the Surgeon General of the Navy for 1911. The rates given are per thousand of each occupational group. For example: Among midshipmen and apprentice seamen, the two groups of the Navy Personnel which are distinctly composed of those who are new in the service, the admission rate for contagious diseases for the year ending June, 1910, was 417 and 598, respectively. While the average rate for all other groups was 84, the one coming next below midshipmen and apprentice seamen was only 123. The same parallel exists in the case of skin and venereal diseases and non-venereal diseases of the genito-urinary tract.

These conditions, although preeminently those of new arrivals, produce, also, a high rate of admission and damage

amongst the other occupational groups, and it is evident that this is a matter which demands close study and the utmost exertion toward betterment. With this end in view, the personnel receive careful instruction as to how to care for their persons and effects, to obtain the highest degree of cleanliness, and they are constantly inspected by those in authority to see that instructions are carried out. Ample facilities for bathing and washing clothes are provided; shower baths are being substituted for buckets and tubs; the most modern toilet facilities are installed, kept immaculately clean and in addition are sterilized with the steam hose at regular intervals. The men are instructed in the dangers of venereal diseases and provided with prophylaxis. They also receive the prophylactic inoculation for small-pox, typhoid fever and diphtheria. The sanitary bubbling spring type of faucet has been substituted for the old universal drinking cup. Isolation rooms for contagious diseases now form a structural part of the new vessels. Detention barracks have been established at large stations. Methods of fumigation are available, and steam disinfectors of a size ample to contain bedding, etc., have been installed at stations, hospitals and on board hospital ships. These indicate some of the methods being used to limit the damage caused by these diseases.

3. Affections depending upon ship life.

These have been largely covered by the discussion under section *2*, but there are certain conditions which develop on board ship that are closely confined to the force afloat, namely, drowning, eye strain, the effect of gun fire upon the ears, heat exhaustion and thermic fever.

It has been long realized that those "who go down to the sea in ships" furnish a large number of deaths by drowning, and the Navy has been proved no exception. Every possible precaution has been taken to prevent this loss of life, yet it persists. Although the actual numbers have not been great, in proportion to the number of men exposed, the damage resulting by reason of loss of service has been considerable. Upon investigation it was found that an astonishingly large number of individuals not only were unable to swim, but could not even support themselves in the water for a brief period. In order to rectify this condition, compulsory swimming exercises have been inaugurated, and all who are ignorant of the art are instructed and required to attain a certain proficiency.

Eye strain on board ship is a grave problem. Injury results from the use of telescopic sights for guns and the periscope in submarines; from the brilliant light produced by the high powered searchlights, reflection of sun's rays from water, and the necessity for the constant use of artificial illumination below decks.

The result of an engagement with an enemy largely depends upon the accuracy with which shells are thrown against the opposing vessel. This, in turn, depends primarily upon the aim of the gun-pointer who sights the gun. In the long distance combats of to-day a telescopic sight is necessary, and through this the gun-pointer must be looking continuously, subject to constant motion resulting from concussion of gun fire, vibration produced by engines and the rolling of the ship. They are specially selected men with a high standard of visual acuity, yet there is evidence that their sight deteriorates under the strain.

The general illumination of a war vessel is rendered a difficult problem through the peculiar structural makeup of a ship designed primarily for a fighting machine. A considerable portion of the interior never sees the light of day, and the proper placing of electric bulbs is hampered by the limited head room and bulkhead space. The result is that the brilliant source of light is on a line with the eyes in living compartments and is incorrectly placed for desk work and reading.

The effects of gun fire upon the ears are produced by the blast of the discharge setting the adjacent air in violent motion—the resulting waves beating against the tympanum. They vary from simple "ringing in the ears" to rupture of the drum and total deafness, the severity of the injury depending upon the position of the individual relative to the gun, the repetition of the exposure and the condition of the ventilating apparatus of the middle ear. Special devices for taking up this tremendous shock are being tested, but as yet none has proved entirely satisfactory, owing to the diversity of requirements—protection, easy adjustability, long life, admission of voice sounds, non-interference with the use of telephone, voice tubes, etc.

Heat exhaustion and thermic fever are found mostly amongst the fire room force, men who perform hard manual labor in high temperatures under conditions of heightened atmospheric pressure, caused by mechanisms for the production of forced draught; the typical prostration of these individuals is associated with marked and excessively painful muscular cramps due, it is thought, to the great loss of body fluids.

The necessity for preserving in the service the trained units concerned and keeping them in the highest state of efficiency is fully realized, and these problems are receiving careful study with a view to ameliorating the bad effects produced.

4. Affections depending upon exotic exposure.

Malaria, dengue and dysentery are included in this group. The present necessity for a large proportion of the Navy personnel to spend much of their time in tropical countries in recent years has brought these conditions into prominence. This is intensified by required service on shore, under unfavorable circumstances—landing parties, military expeditions, surveying, etc.

From a study of the table referred to above, it is seen that this is particularly well shown in the case of malaria. The highest admission rate is amongst the enlisted force of the Marine Corps, and it is this body of men who perform the larger portion of the duty on shore in the tropics.

5. Special hygienic problems.

Tuberculosis.—This disease was the cause of 19 deaths and 11,913 sick days during the year ending June 30, 1910, and gave rise to the greatest number of discharges for disability during that period. Among the predisposing causes of this disease on board ship are insufficient ventilation, promiscuous expectoration, and the sailor's habit of frequently sleeping upon a mat on the deck where he would most likely suffer contact with the inspissated sputum. A study of the occupational table shows that the greatest number of cases occur amongst the Hospital Corps men. The duties of this group confine them below decks where they are exposed to conditions resulting from poor ventilation and they are more apt to be intimately associated with cases of the disease than members of other groups. The artificers (electricians, engine room force, plumbers, etc.), the clerical force and musicians, all show a high rate for this condition and are groups whose duties confine them below decks.

The ventilation of ships of war has made immense advances in the past few years, but there still remain many obstacles that must be removed or overcome.

Prolonged tours of duty in the tropics prove ultimately deleterious to the personnel. Monotony and nostalgia incident to such service produce nervous effects, which cannot be regarded as negligible. Service under such conditions is apt to be perfunctory and half-hearted and too frequently results in nervous disorder or infraction of regulations, due rather to mental state than to criminal intent.

The injury and loss of life from exposure to noxious gases in ship compartments resulting from accident have been considerable and, it is believed, could be greatly lessened if rescue parties were able to go to the relief of their comrades. With this end in view various types of "Rescue Apparatus" are being investigated with the idea of distributing them generally throughout the service. In connection with this subject and

that of drowning and for meeting the accidents of anæsthesia, different forms of pulmotors are being studied, and it is hoped that they will ultimately form part of the equipment of all ships, stations and hospitals.

SOME OF THE NEWER INSTRUMENTS OF PRECISION.

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During the past few years a number of ingenious appliances have been devised as aids in medical diagnosis. Some of them have been improvements on previous models; others are entirely new instruments. The Hirschfelder modification of the Erlanger sphygmomanometer is an example of the one kind, and the micrograph of the other. But none of these instruments have been known to practising physicians in the degree that their importance has warranted; in fact, in most instances they have been hidden away in foreign or special journals, or merely figured in the catalogues of instrument makers. This being the case, I have undertaken to furnish a description of some of the more important, knowing that our medical public is always appreciative of any appliance that can throw additional light on the many problems of diagnosis that constantly confront us in practice. I shall describe briefly the Hirschfelder modification of the Erlanger sphygmomanometer, the Uskoff sphygmotonograph, the phonoscope, the micrograph, and the viscosimeter.

The Erlanger Sphygmomanometer and Hirschfelder Polygraph.

The Erlanger sphygmomanometer has recently been made more elaborate by having attached to it the Hirschfelder polygraphic machine. It thus combines sphygmomanometry and polygraphy. The patient lies in a nearly horizontal position,

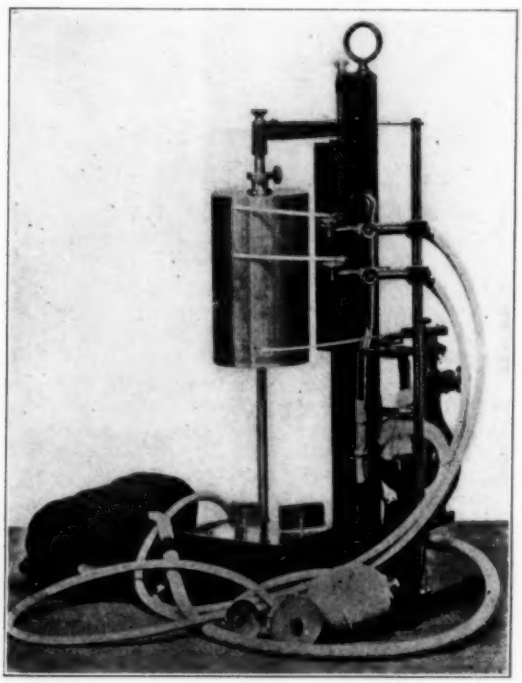

FIG. 1. ERLANGER SPHYGMOMANOMETER WITH HIRSCHFELDER POLYGRAPH.

with the head and neck supported by a single pillow. The cuff is adjusted for the right arm, and the maximal and minimal blood pressure is taken. Then two additional levers are mounted on a tangent stand, and connected with long pieces

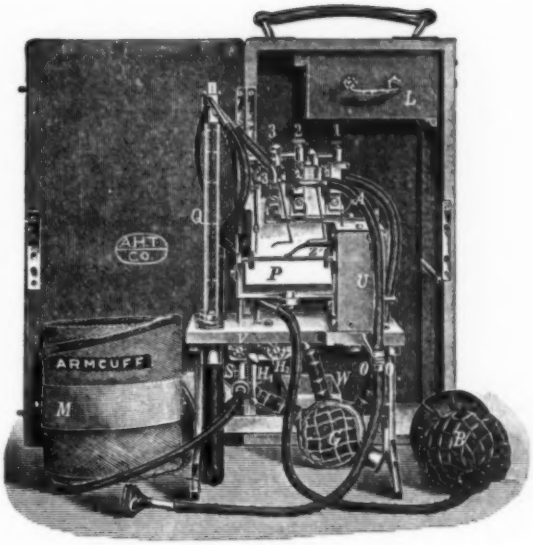

FIG. 2. USKOFF SPHYGMOTONOGRAPH.

of rubber tubing attached to the Mackenzie receivers for the jugular and apex or carotid. When the jugular is to be taken, the patient turns his head to the right and downward, so as to relax the right sterno-mastoid. To take the brachial tracing, the cuff is inflated at minimal pressure. The carotid pulse is taken by putting a small tambour over the carotid when it is beating actively. In this way three separate tracings may be obtained. The interpretation is the same as given by Mackenzie.

The Uskoff Sphygmotonograph.

The Uskoff instrument, known as the sphygmotonograph, (Fig. 2) records simultaneously in millimeters of mercury the blood pressure of the carotid or jugular pulse, the apex beat, the brachial, and the time in fifths of seconds.

The method of using this instrument is as follows:

The cuff (M) is attached in the usual manner to the upper arm and pressure applied by means of the bulb (B) until the pulse disappears. The pressure thus applied is first transmitted to the mercury manometer (Q) lifting the perforated float as the mercury column rises. At the same time it is transmitted to the rubber bulb enclosed in the glass bulb (G) which is in air-tight connection with both the cuff and the manometer. With the handle of the cock (H_1) in the vertical position, the air in the glass bulb is expelled through the cock (H_2) which should be opened at the same time as (H_1).

When the pulse has, by application of sufficient pressure, disappeared, the cock (H_1) is turned in the direction of the arrow, which movement connects the glass bulb (G) with the outside air through an exceedingly small opening and the pulsations appear because air pressure in the cuff and manometer is thus slowly relieved through the valve (V) and is divided between the rubber bulb and the air in the glass bulb (G). The pulsations are at the same time transmitted from the air in the glass bulb (G) by means of the third tubulature in connection with the indicator, to the tracing paper.

The pressure arising from compression of the rubber bulb (B) is also transmitted to two small outlets confronting each other on the top of the manometer and between which openings the perforated float passes as it rises and falls on the mercury column. The small holes in the float are arranged 1 mm. apart with outstanding marks, indicating 50 millimeters of mercury. The passage of the air current through the small openings and through the corresponding perforations in the float, operates indicator 3, and thus graphically records the actual pressure in millimeters of mercury at any moment during the operation.

Explanation.—The upper tracing (A) represents the blood pressure in millimeters of mercury, and the tracing is made while the pressure is reduced from 200 mm. to 50 mm., each vibration representing 2 mm. of the mercury column.

The second tracing (B) represents one taken from the carotid artery and recorded by indicator 2. This indicator may be used to record either the apex beat or the jugular or other vein pulsations at will.

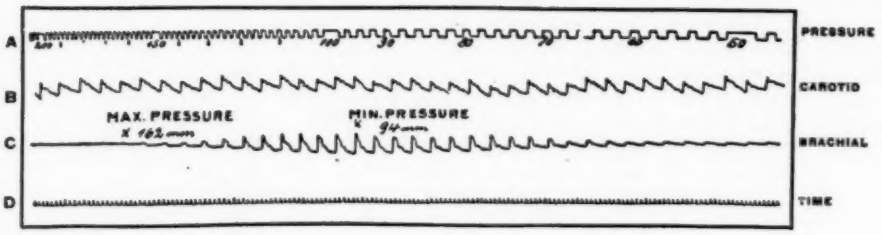

FIG. 3. SPECIMEN TRACINGS.

The third tracing (C) is the sphygmotonogram or the tracing of the arterial (brachial) pulse under a falling pressure. With 200 mm. of pressure this indicator traces a straight line because of the total obliteration of the pulse. At 162 mm. of pressure the pulse reappears and at 92 mm. of pressure has reached the lowest point of maximum oscillation. If the float on the mercury column continues to sink, the internal pressure is shown to be greater and the vibrations become smaller and smaller because of the elastic layer between the cuff and the artery, until they disappear entirely. This tracing taken under diminishing pressure constitutes, therefore, an accurate record of both the diastolic and systolic pressure.

Arthur H. Thomas of Philadelphia is the agent for this instrument.

Phonocardiography.

A special method of registering heart sounds and murmurs has been devised by Professors Joachim and Weiss of Königsberg, in Prussia. It was first described in 1908.[1] The sounds and murmurs are registered by photography, and are then reproduced. Last year these experimenters revised their work, publishing their results as applicable to diagnosis in valvular affections.

The sensitive membrane which receives the sounds is composed of a mixture of soapy water and gelatine, prepared as follows: To one liter of warm distilled water is added 25 grams of Marseilles soap. After thorough solution it is cooled, and 660 grams of glycerine are added. This is again cooled down and filtered until the solution is quite clear. It can then be kept indefinitely without change in closed vessels. This preparation is used as a sensitive membrane to receive the sounds in the phonoscope, and it is claimed that this saponaceous membrane surpasses the most delicate microphone in sensitive qualities as a receiver.

As a medium for conveying the oscillations of the membrane there is a silvered glass filament, bent at an angle, planted in the center of the membrane. The oscillations of the rod are photographed by a registering photographic apparatus, actuated by clock-work, and similar to the machine used in the Einthoven cardiographic machine. The membrane and glass lever are fitted into a case called a phonoscope (Fig. 4). This is a small metal box resting on a vertical support (L), provided with three adjustable feet (F F F). In one side is a glass window (A), having a diameter of about one and a quarter inches. On another wall there is a shutter, in the middle of which is a tube (J), into which is fitted a socket (E) provided with a circular opening over which the soapy membrane is drawn. The glass lever is attached to the top of the box by shellac, while the opposite end, forming a loop, is planted in the soapy membrane. The sliding shutter (K) enables the operator to move the lever into the required position.

The glass filament is illuminated by an objective in the tube (H), while another objective (S) projects the image of the filament on the sensitive paper. A telephone sirene is then introduced in a telephone circuit, and the ear hears the sound in the telephone receiver.

This is an improvement on the apparatuses of Huerthle,[2] Donders, and others. Huerthle's method was to place a stethoscope over the site of the apex beat; on the opposite end of this instrument was a resonator made of a hollow wooden cone, in the apex of which was screwed a wooden rod. This latter was the carrier of twenty-four thin plates of wood to increase the resonance, while on the end of the wooden rod was a wooden tuning fork. Between the branches of this was a microphone, the contact being made by means of opposing armatures of silver and carbon. By connecting this instrument with the telephone the heart sounds were conveyed to the listener.

The Micrograph.

The micrograph is an instrument that magnifies the vibrations of a diaphragm, similar to that of the telephone, about 50,000 times, and records them on a moving photographic film. The word micrograph is used to indicate that it records microscopic movements. It was devised by Albert C. Crehore, Ph. D.[3] The apparatus consists of the instrument proper, and the photographic attachments. An ordinary receiver, connected with a flexible rubber tube, conveys the vibrations through a

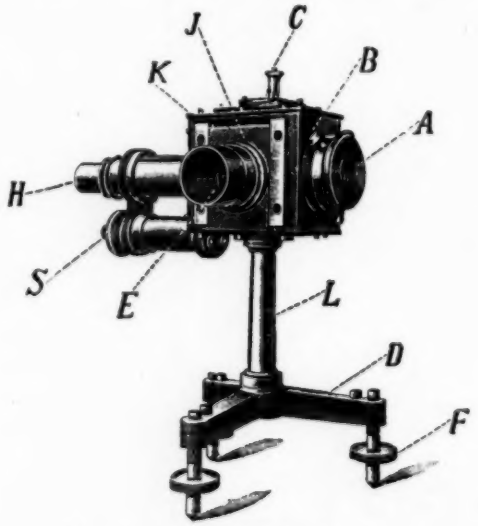

FIG. 4. PHONOSCOPE.

column of air to the diaphragm, attached to which and parallel to it is a cylindrical lens, whose plane surface is turned to the reflector.

Now, if a source of light (in this case the mercury-vapor lamp of the Cooper-Hewitt system) is thrown on the surfaces of the reflector and lens, the observer will see a series of interference bands on the surface of the reflector. These com-

[1] Joachim und Weiss, *Arch. f. Phys.*, 123, p. 908 u. 341; *Deutsch. Arch. f. Klin. Med.*, 98, 1900, s. 513.

[2] *Arch. f. Phys.*, Bd. 60, s. 263, 1895.

[3] Through the courtesy of Dr. Frank S. Meara I have seen it in operation.

prise a number of concentric circles, which by means of another lens can be thrown on the ground glass of a camera.

If, now, a slit is made to intervene between the lens just mentioned and the photographic plate, so as to cut off all the light of the image except that which passes through it to the plate, and the plate is moved across the slit at a uniform rate, the several bright areas of light along the diameter of the image will trace lines on the plate, and the developed negative will show a corresponding series of wavy bands. These bands are constantly changing, according as the lens and reflector approach or recede from each other, as they do during the vibrations caused by the movements in the closed currents of air. The well-known principle of light interference, discovered by Young in 1801, is used to produce the waves. As the photographic film is carried along by a motor at a given rate of speed, the length of the waves and wavelets in the cardiac cycle is easily determined. By means of a pair of dividers to measure the time intervals from band to band, and by counting the number of bands, a curve can be plotted with accuracy.

By means of this instrument, not only can tracings be taken of the apex beat, the radial and the jugular, but heart sounds can also be registered. By using the ordinary armlet, systolic and diastolic pressures can also be photographed, and determined subsequently by a scale furnished for the purpose. In fact, this ingenious instrument is apparently destined to aid us materially, in conjunction with the electrocardiograph and the polygraph, in further elucidating the problems of the cardiovascular mechanism.

The Viscosimeter.

During the past ten years, a good deal of attention has been given to estimating the viscosity of the blood, especially with reference to its bearings on clinical medicine and surgery. The method of determining viscosity is not difficult, requiring only a simple and inexpensive instrument. All that is necessary is to note the time taken by a given quantity of blood in passing through a glass tube of definite calibre and length, and then to compare this period with the period required for distilled water to pass through another tube of similar bore and length. The index of viscosity is expressed in numerals, such as 1.50, 2, 4, 5, etc., which denote that the time occupied in passing through the tube is one and a half, two, four, or five times that of distilled water, the standard being 1. The normal viscosity is set at from 4.25 to 5.

The instrument itself is called a viscosimeter, and the principal models, called after those who have designed them, are the Huerthle, Hirsch and Beck, A. Mayer, Demning and Watson, Tissot, Burton-Opitz, Determann, Hess, Muenzer and Bloch, MacCaskey, Zangger and Scarpa. These instruments vary as to reliability, but in the best the error is said to be not more than 2%, a negligible quantity.

At first it was thought that viscosity bore a tolerably uniform ratio to the hemoglobin content, the corpuscle count and the specific gravity of the blood. But so far as leukemia at least is concerned, with a viscosity of 5.12 or slightly above the normal bound, there has been found to be a hemoglobin content of 60, the normal being about 100. Determann[4] has also found that it is not the corpuscle count that preserves a fairly uniform ratio with the viscosity, but rather the volume of the combined red and white corpuscles; while it has also been found that from 4% to 20% more of viscosity resides in the white corpuscles than in the red. The material causing viscosity is in their interior, and is liberated when they disintegrate. The specific weight of the blood has been found to have nothing to do with the viscosity.

On the other hand, the gaseous content of the blood has much to do with it. When this fluid becomes oxygenated in the lungs, it furnishes oxygen to the tissues, in return for carbonic acid gas, while the chlor-ions are absorbed by the corpuscles, together with water from the serum, and thereby the corpuscles become swollen. This increase in viscosity is shown in a comparison between venous and arterial blood. But serum-albumin also increases viscosity, though not to the extent of the sodium salt. According to Adam,[5] viscosity is reduced by the iodides and bromides of potassium; in fact, other drugs affect it.

Viscosity increases also after severe manual exercise, and is modified by diet. So far as the increase in viscosity in cardiac and pulmonary affections is concerned, Determann thinks that it does not affect the circulation uniformly. It is compensated for in some way. The use of the cold bath increases the viscosity; the hot bath reduces it at first, but raises it subsequently to the normal or above it.

From a series of researches by Oehlecker[6] in acute surgical diseases of the abdomen, classed as simple appendicitis, appendicitis with localized peritonitis, and diffuse purulent peritonitis, it was found that in the first class the viscosity was 4.5; i. e., it was within the normal range. In the second class it averaged 5.3, or was raised slightly above the normal; while in diffuse peritonitis it varied from 5 to 6.3, and in two fatal cases rose to 7 and 7.1. Judging from these facts, it appears that the viscosimeter may help to determine the extent of peritoneal involvement. And inasmuch as hemorrhage is associated with a viscosity that is low proportionately to the amount of blood lost, the estimate of viscosity in such cases may help in the differential diagnosis between simple appendicitis, adnexitis, ruptured ectopic pregnancy, or, in fact, any form of internal hemorrhage. Sex, age, and constitution, however, apparently have an influence in increasing or decreasing viscosity.

It will be seen, therefore, even with our fragmentary present knowledge of the relation of viscosity to morbid states, that there is a promise of valuable results from the use of the viscosimeter. The subject is certainly one of interest, but requires more extended observation than has been given it. The estimation of viscosity may eventually be of practical use to practitioners—in fact, it is quite within the bounds of possibility that further researches may alter our misty ideas of its value as a diagnostic resource—but at present it is of more interest to the physiologist than to the practitioner, and we are not yet justified in recommending the viscosimeter as a useful addition to the present armamentarium of the physician's office, or of the hospital.

According to Burton-Opitz,[7] one of the most recent writers on the subject, the rapidity of the blood current depends on three factors: The driving force, the peripheral resistance, and the viscosity, of which the latter is the feeblest factor. Naturally, the rapidity of the flow varies inversely with the viscosity; i. e., the greater the viscosity, the more is the current of blood slowed. Under ordinary circumstances, however, increased action of the heart or dilatation of vessels overcomes the viscosity; but if this action, which is automatic, is inhibited by disease or otherwise, the slowing effect of the viscosity will not be overcome, though it may be decreased artificially by the use of moderately large quantities of normal saline solution. But Opitz believes that clinicians have attached too much importance to the matter.

According to Trumpp,[8] the great objection to viscicometry is that peripheral blood has to be used in the instrument, but as a matter of fact blood differs widely in composition at different times, its composition being dependent on a number of variable factors.

Influenzal cerebrospinal meningitis is not rare and is highly fatal, reports Flexner. It is usually secondary to an influenzal infection of the respiratory tract and is more frequent in infants and children.

[4] Determann: Die Viscosität des Menschliches Blutes, Wiesbaden, 1910.

[5] *Zeitschrift f. Klin. Med.*, 1909.
[6] *Berl. Klin. Woch.*, March 28, 1910.
[7] *Jour. of the Amer. Med. Assoc.*, July 29, 1911.
[8] *Jahrb. f. Kinderheilkunde*, Vol. LXXXIII., s. 1-288.

SURGICAL INDICATIONS OF THE RIGHT QUADRANT OF THE UPPER ABDOMINAL TROUBLES.

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Pain is of the greatest importance, not only as a symptom, per se, but because of its influence in bringing the patient to a realization of his condition. It is always an indication, directly or indirectly, of the organ or organs involved. Upon its character, location and association with other symptoms, and the history, rests the foundation for a diagnosis.

To fully appreciate the value of pain of the abdominal organs, we must be familiar with the nerve supply to the organs themselves, as well as to the overlying abdominal wall; and the relationship which exists between them and the consequent reflexes which result.

The skin and muscles of the abdominal walls receive their nerve supply from the lower seven intercostal nerves and the ileohypogastric. It is important to remember that these nerves supply both the skin and the muscles of the abdominal wall; it is also of vast importance to remember that these seven dorsal nerves are intimately connected with the sympathetics, supplying the abdominal viscera through the lower thoracic ganglia, from which the splanchnic nerves are derived. This fact accounts for the muscular rigidity in injury, rupture or diseases of the abdominal viscera or acute peritonitis.

As this subject is limited to the upper right quadrant of the abdomen, I will confine myself largely to the question of the surgical indications and treatment of the lesions of the stomach and duodenum, gall bladder and ducts, and the pancreas with special emphasis on the stomach and duodenum.

The Stomach and Duodenum. The stomach is divided into two main portions; the larger bag-like end or cardiac end; the smaller or pyloric end which is the actively motile portion. The stomach as seen after death gives one the wrong impression of its anatomy and function. It is not a thin-walled, flabby organ, but one possessed of a powerful musculature, the muscle fibers being arranged longitudinally and circularly; the circular fibers being much larger and in greater numbers in the pyloric end, reaching their greatest development at the pyloric sphincter.

It takes the food about four seconds in the normal individual to pass from the mouth to the stomach. The food remains in the cardiac pouch from 20 to 30 minutes, where it is subjected to a constant steady pressure by the stomach wall, and is not churned violently. This pressure pushes the mass, part by part, into the pyloric end, where it is thoroughly mixed with the gastric juice by the much more powerful musculature of this portion of the stomach.

As the food mass arrives at the normal degree of acidity, the pyloric sphincter is stimulated and opens, and the proper amount is violently projected into the duodenum, which again closes when the alkaline duodenal juice neutralizes the acid mass just received from the stomach.

You can see, then, that the duodenum has as much control over the function of the pyloric sphincter as has the stomach. This fact is of importance when we relate it to the fact that the stomach and duodenum are both derived from the fore gut, and are therefore largely under the control of the central nervous system, and are to an extent independent of purely reflex control of the sympathetic system.

This is one of the reasons why peptic ulcer is so much more common in the stomach and the first portion of the duodenum than in the rest of the small intestine.

Peptic ulcers occur in an acute and chronic form. As gastric ulcers they may involve any portion of the stomach from the cardiac to the pylorus. In the duodenum, their most frequent location is in the first two to two and a half inches from the pylorus, although they do occur as far down as the papilla.

Acute gastric ulcers are far more common in young females of chlorotic tendencies, and present irregular outline and thickened edges. The chronic forms occur most often in males, in the proportion of 72 in males to 28 in females (Fenwick). The duodenal type is more frequent in men, while chronic gastric ulcer is more common in women. Welch gives 40% to 60%, and Robson 3 to 1.

There have been many theories advanced as to etiology. The one, however, which is most commonly accepted is that of a septic origin. Oral sepsis swept down into the stomach gives rise to a more or less active gastritis, with hypochlorhydria, which is responsible for the disturbance of the stomach and duodenal mucosa, which is the essential factor for the development of ulcer by the action of the gastric juice. Low grades of general sepsis arising from such causes as chronic appendicitis and the associated colitis; chronic infections of the biliary apparatus and the genito-urinary organs; may precipitate a thrombosis in a terminal radicle of a stomach or duodenal vessel, and thus be the opening wedge for the digestive action of the gastric juice.

Acute peptic ulcer is found usually in the stomach and is of several varieties.

First, erosions of the mucosa which are mere abrasions of the epithelial surface and so small as to be nearly indiscernible to the naked eye. Here we may have severe hemorrhage.

Second, simple ulceration. (Dieulafoys Ulcer). Here the lesions are more extensive and the ulcerations somewhat deeper than in the abrasive form. Here we may have massive hemorrhage, quickly causing death, if not arrested by treatment.

Third, the acute round ulcer of Crouveilhier. Here we have the round, punched out ulcer without indurated edges, the sides resembling a crater, the broadest diameter being towards the lumen of the stomach. Here we are apt to have severe hemorrhage, and a marked tendency to perforation.

The treatment of acute gastric ulcer is distinctly medical. Hematemesis, sudden and massive, is frequently the first intimation of the trouble, or at least of the serious nature of the trouble, and hemorrhage is the thing which must be controlled. Anatomic and physiological rest is to be secured and the means to be employed are rest in bed and opium. Ice applied to the abdomen may help some. Ice swallowed interferes with physiologic rest. Hemostatics do little or no good. Adrenaline may control the bleeding for a while if it be brought in contact with the bleeding point. I have observed, however, that when the effect of adrenaline wears off, the consequent relaxation of the vessels will encourage fresh bleeding. One must also supply fluid to the circulation, and this can be best accomplished by proctoclysis or hypodermoclysis. It is not wise to use intervenous transfusion of salt solution, until the bleeding point has been controlled, because the sudden rise of blood pressure caused by throwing 2000 or 3000 c.c. rapidly into a vein will encourage bleeding by washing formative thrombi out of the opening in the bleeding vessel.

The surgical indications in acute ulcer are when the bleeding recurs or when an ulcer has perforated.

The chronic form of the disease is the one which most interests the surgeon, for it is rapidly becoming recognized that the proper treatment is operative and radical; and, yet, the successful outcome of a given case depends as much if not more on the medical attendant than on the surgeon. These cases should be operated on early, and this, in turn, depends on the early recognition of the condition and the proper advice.

Chronic ulcer of the stomach and the duodenum may be single or multiple. Fenwick (*Ulcer of the Stomach and Duodenum*) says that chronic gastric ulcer is solitary in 87 per cent.; and in acute ulcer 46 per cent.

The great majority of chronic ulcers are at or near the pylorus; the so-called juxta-pyloric ulcer of the French au-

thorities, and this is probably the better classification. The treatment of ulcer at or near the pylorus is not materially influenced by the fact of its location on the gastric or the duodenal side. There is still a difference of opinion among the English and American authorities as to whether gastric or duodenal ulcer is more common, the accepted anatomical line being the pyloric veins. These veins, however, are not constant in their course; which may explain the difference in the observations of surgeons.

It is a commonly accepted fact that gastric ulcer is more liable to carcinomatous implantation than in the duodenal type, and for this reason excision is more strongly indicated.

The Mayo brothers found in a series of two hundred and thirty-one operations for ulcer that one hundred and fifty-eight were gastric; sixty were duodenal, and fourteen were gastric and duodenal combined. This form of ulcer is irregular in outline, associated with marked thickening of the edges, and varies in size from one-eighth of an inch to six or eight inches in diameter. They may be saddle-shaped, involving both the anterior and posterior walls, at either the larger or the smaller curvatures. They may be circular, entirely surrounding the pyloric opening.

The question of prognosis is extremely interesting, as it is governed largely by treatment. As I have said the disease is rapidly being recognized as a surgical disease, because the results of surgical treatment have been so far the best reported. Mayo Robson in his article on ulcer of the stomach has collected some very valuable data on this point. He quotes Debove and Redmond, who analyzed 100 cases, presumably both acute and chronic ulcers, with 50 per cent. perfectly cured. Thirteen died of perforation or peritonitis, five from hematemesis, twenty of phthisis, five of inanition, and five from other complications. Bulstrode analyzed all the cases admitted to the London Hospital for gastric ulcer from 1897 to 1902. There were 500 cases, presumably both acute and chronic. Of this number nearly ten per cent. died from peritonitis; 2.5 per cent from hematemesis; 5.5 per cent. of other causes; a total of approximately eighteen per cent.

This does not, however, take into account the 32 per cent. of cases of ulcer discharged as relieved or cured, who subsequently had other attacks of the trouble. Some idea can, however, be formed by ascertaining the number of patients admitted to the hospital with gastric ulcer who had already been treated for and cured of similar attacks. Bulstrode calculated that out of the 500 cases, no less than 211 (42%) had suffered this way previously. He states that gastric ulcer recurs or relapses in at least two-fifths of the cases which are apparently cured.

Patterson (*Lancet*, Feb. 24, 1906, p. 499) collected 153 cases of gastric ulcer, of whom six died in the hospital, and 147 were discharged as cured. He was able to trace 72 of the cases. Of this number, 40 were found to have definite signs of gastric ulcer; five have been subsequently operated on for hematemesis; constant vomiting; for vomiting and hematemesis; and hour glass stomach; one patient died one year later of carcinomatous ulcer; of the remaining patients, 12 have at the present time no signs of gastric ulcer, five patients are probably not cured, two others are probably cured. So that out of 72 patients that left the hospital apparently cured, only 10 are at the present time free from symptoms of gastric ulcer. This means that 64% of the series were uncured by medical treatment. Robson reports his own cases, a series of 300, all operated on, all of which had failed to yield to medical treatment, with a total of 90% completely relieved of all symptoms. His immediate mortality excluding perforation was 3%.

The symptoms of ulcer of the stomach or duodenum are pain, tenderness, vomiting, hematemesis and dyspepsia. Hematemesis is a much more common symptom of the acute variety and may be the first and only symptom, although a history of indigestion can usually be obtained if sought for.

In chronic ulcer, chronic, persistent, intermittent attacks of indigestion are significant. In the vast majority of cases of chronic dyspepsia, there is an organic lesion at the bottom to explain the trouble. Dyspepsia is a symptom and not a disease.

There seems to be a peculiarity about the dyspepsia in that it comes on in distinct attacks, lasting for days or weeks or even months, and then there is a period of comparative freedom and comfort. The dyspepsia is characterized by hyperacidity which manifests itself by eructations of sour, acrid water, giving temporary relief and which is also relieved by taking alkalines. When obstruction to the pylorus comes on, the symptoms change. The hyperacidity diminishes and may give way to a total absence of free hydrochloric acid, and only show lactic acid. Absence of free hydrochloric acid, the presence of lactic acid and yeast ferments with the Oppler-Boas bacillus, do not mean carcinoma, necessarily, but only that there is stagnation and the chemical and fermentative changes which take place as a result of stagnation. One is justified in strongly suspecting carcinoma under these conditions, and the evidence is strongly enforced when the patient has lost weight and strength and there is a palpable tumor present in the epigastrium.

The pain of ulcer presents several typical characteristics. It is present in the epigastrium, either to the left or right of the midline, depending upon the location of the ulcer; to the right in ulcer of the pylorus, either gastric or duodenal; to the left when nearer the body of the stomach.

The pain is burning and aching in character, not sharp and colicky. If there is associated with the ulcer, pylorispasm, we may have pain of a colicky nature, but not so severe as in biliary colic or appendicitis.

Pain has a relationship to eating. When the ulcer is near the cardia, pain comes on a short time after the food reaches the stomach. When the ulcer is in the body of the stomach, it comes on in about one-half to three-quarters of an hour; when in the pyloric end of the stomach, it comes on in from two to three hours after eating. When pain comes on in from four to six hours after eating, the location of the ulcer is in the duodenum. The late onset of pain in duodenal ulcer accounts for the hunger pains, and the occurrence of pain during the night. The taking of food here prevents the escape of the acid stomach contents into the duodenum, and for the time being the patient is relieved from his symptoms. The pain of ulcer is usually relieved by vomiting.

Tenderness may or may not be present, but when it is it usually corresponds to the location of the ulcer. The tenderness of ulcer in the body or lesser curvature is located just below the left costal margin, and is associated with a tender spot over the ninth and tenth vertebræ, or just to the left of the spine. Ulcer of the pylorus shows tenderness in the epigastrium, and ulcer of the duodenum shows tenderness to the right of the median line and about one to one and a half inches above the umbilicus. Tenderness is rarely marked and is not a constant or pronounced symptom. It is significant, when present, as it indicates involvement of the peritoneum and approaching perforation.

Hemorrhage in chronic ulcer is variable. It rarely is severe. A patient may spit up a mouthful of blood-stained mucus, or often its presence can only be demonstrated by one of the chemical tests. In duodenal ulcer, it is most frequently found in the stool; there, also as occult blood rather than in amounts sufficient to be recognized as a tarry stool.

The diagnosis of gastric and duodenal ulcer is not so easy to make as some of the authorities would lead us to believe. A history of chronic dyspepsia should always arouse the suspicions of an organic lesion, for, as I have said, dyspepsia is a symptom and not a disease. The etiological factors to be considered are pulmonary tuberculosis, grave heart lesions, chronic appendicitis causing pylorispasm, chronic septic colitis, gall stones and chronic infection of the gall-bladder,

chronic pancreatitis, movable and floating kidney, ptosis of the stomach, ulcer of the stomach and duodenum, and carcinoma. Derangement of the female generative apparatus, chronic nephritis, and the nervous type of dyspepsia, and chemical poisons must also be considered in this connection.

Given a chronic dyspepsia with hydrochlorhydria, with remission and exacerbation, with periods of comparative health, associated with pain, relieved by vomiting, or by the administration of alkalies, and particularly if relieved by eating, we can be reasonably sure of a diagnosis of ulcer.

If, in addition to the above we have tenderness in the epigastrium and evidence of blood in the vomitus or stools, we can be sure of the diagnosis.

If the normal time for emptying the stomach be delayed by reason of interference of the action of the pylorus, we are justified in locating an ulcer in that position, the induration of which has rendered the pyloric sphincter less active, and at once brings to mind the possibility of carcinoma ingrafted on an old ulcer.

The operative treatment of peptic ulcer of the stomach and duodenum depends upon its location.

If near the cardia or in the body of the stomach, excision is the procedure of preference. This is comparatively easy and safe if the ulcer be on the anterior wall. If the ulcer be on the posterior wall, there are two ways by which it can be reached: First, through the gastroheptic omentum and lesser peritoneal cavity; or by a trans-gastric route, which in my opinion is the safer method. If the ulcer be near the pylorus, the juxtapyloric ulcer of the French, we have excellent methods of attack, all of them useful in certain cases:

First, gastro-jejunostomy, alone or combined with closure of the duodenum by plicating sutures. This is but a temporary closure, but, as a rule, it persists a sufficient length of time to allow the ulcer to heal as a result of drainage through the artificial opening between the stomach and jejunum.

Second. Excision of the ulcer, if it be small and well circumscribed. The advantage here is that we reduce the healing to a minimum and remove the serious risk of carcinomatous involvement.

Third. Excision of the pylorus. This is indicated in large ulcers with marked thickening, where carcinoma is strongly suspected.

Fourth. Finney's modification of gastro-duodenal anastomosis is indicated in benign ulcers and particularly those that have healed and are causing pyloric obstruction.

Let us consider the operative indication in diseases of the gall-bladder and ducts.

Gall stones, we know, can remain in a gall bladder for an indefinite time without giving rise to symptoms. It is only when infection supervenes that the diagnosis becomes apparent. The pain of biliary colic differs materially from that of gastric or duodenal ulcer. It is distinctly colicky in character, is of great severity, is not related to the intake of food, and is not relieved by vomiting or the injecting of alkalies. It starts in the region of the gall bladder, and later becomes general, a distinguishing point from acute attacks of appendicitis, where pain begins as a general abdominal pain and later localizes in the region of the appendix.

It is a question whether the pain of biliary colic is due to the actual passing of the stone through the cystic or common duct or to the distension of the gall bladder and duct due to blocking of the lumen.

It is, as a rule, wiser not to operate in the presence of an acute cholecystitis. It is better to wait for a period of quiescence, when the contents of the gall bladder are less infectious, for the obvious reason that there is less risk to the peritoneum. In cholelithiasis of the gall bladder we have two methods of procedure: First, cholecystostomy, with removal of the stones; and second, cholecystectomy. The latter procedure is attended with a higher mortality and should, in my opinion, be confined to those cases where it is evident that the gall-bladder is functionless either from cicatricial contraction, gangrene or carcinomatous change.

Stones in the common duct should be removed, either by pushing them into the duodenum with a probe passing through the gall bladder, cystic duct and common duct; or through an incision in the common duct; and failing in both methods, as we occasionally do, when there is a stone in the ampulla of Vater, we can approach it by the transduodenal route. The advantage of a cholecystostomy is that we can provide temporary or prolonged drainage in case we find involvement of the pancreas, for up to date, retro-drainage of the common duct is our only means of relieving surgical diseases of this organ. Permanent drainage can be accomplished by cholecysduodenostomy. The type of chronic pancreatic disease which is most benefited by drainage is lymphangitis of the pancreas. When we have the normal histologic elements of the pancreas replaced by scar tissue, drainage will accomplish very little good. In acute pancreatitis, the question of surgical interference is debatable ground. The operation of choice is drainage through the biliary apparatus.

THE PRESENT STATUS OF SPECIFIC CHEMOTHERAPY.*

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It has always been a therapeutic ideal to secure a remedy to act specifically on the cause of the disease. There have been a few such specifics, such as quinine in malaria, mercury and iodine in syphilis, salicylic acid in articular rheumatism and atoxyl in trypanosome diseases. In addition we have in Behring's diphtheria serum an etiologically acting resource of pronounced value. Naturally serotherapy has its limitations, for while the curative substance is able to destroy the cause of the disease without injury to the patient, many infectious diseases are not attended with formation of antibodies to a curative extent. This is especially true of diseases caused by the more highly organized microorganisms (protozoa). The clinical course of this class of maladies shows that certain obstacles oppose the salutary reaction of the organism. In such cases we are forced to seek remedies which can actually destroy the parasites by chemical means. This new direction of therapeutics is known as chemotherapy. For the health of the body cells it is of the greatest importance, not only for large but for small doses, that as few doses as possible be given,—even a single dose if practicable. First must be determined the largest dose of a given remedy which an organism of a particular species can tolerate, and then the dose which is sufficient to destroy the parasites which have produced a given disease. The more suitable the remedy the smaller the fraction which obtains between the tolerated and curative dose.

The first experimental work was done by Ehrlich on trypanosomes. Next at his request Hata made experiments on recurrent fever in mice and rats, on fowl spirillosis and syphilis in rabbits. The chemicals tested comprised definite azo coloring matters (trypan red, trypan blue and trypan violet), basic triphenylmethan coloring matters (parafuchsin, methylviolet, and pyronin) and finally arsenicals.

Arsenous acid produces a corrosive action on the skin and mucous membranes which throws light on the neurotic action of arsenobenzol, or, as it is better known, salvarsan, when employed subcutaneously. The chief action of arsenic in every form of application is a high degree of dilatation and hyperemia of the capillaries, due perhaps to a vasomotor paralysis of the splanchnic nerves which is manifested in all the abdomi-

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nal viscera and especially in the gastroenteric mucosa. It is in consequence of this activity that degenerative processes in the intestinal epithelia and the parenchyma of the liver and kidney result from large doses of arsenic. Acute arsenical poisoning is always manifested by gastroenteric symptoms. In smaller doses arsenic through its capillary paresis causes an increased amount of nutriment to pass from the blood to the tissues and so promotes nutrition.

Arsenic was used in syphilis long before Ehrlich's time. Asiatic pills have been used for obstinate mucous syphilides and improvement has followed injections of arsenical solutions. Ehrlich first used atoxyl after Uhlenhuth had shown its activity in trypanosome diseases; influenced thereto because of Schaudinn's statement that trypanosomes and spirochetes are closely related. But even small doses of atoxyl were found to produce disorders of the stomach and intestines, nephritis and especially amaurosis. Arsacetin, next tested, was found to be even more toxic to the optic nerve. Other arsenicals were tested and the predecessor of salvarsan was arsenophenylglycin. In 1909 Ehrlich prepared the synthetic dichlorate of dioxydiamidoarsenobenzol which was later termed salvarsan. It is a remote derivative of atoxyl and is an acid, an amin and a base and contains 34 per cent. arsenic.

Its chief toxicity or collateral action is demonstrated by causing slight dilatation of the heart, murmurs, tachycardia and extrasystole. Some investigators do not report these symptoms but have seen lowering of the blood pressure, confirmed by animal experiment, and found to be due to the action of arsenic on the vasomotor system. In other words the heart is not directly injured, but the remedy is contraindicated if the heart is the seat of a lesion. If salvarsan appears to cause nephritis it is believed the kidneys were not originally sound. There is no evidence that it is naturally toxic to these organs. In syphilis of the kidney the lesions rapidly recede under the treatment. It may be well not to use the remedy in known nephritis not due to syphilis, or even when there is a suspicion of nephritis, as in a patient who has scarlatina.

The gastric and intestinal symptoms which have been sparingly noted under salvarsan are those which follow the use of ordinary arsenicals.

It is conceded that in some predisposed individuals arsenic induces artificial hemorrhagic diathesis which contraindicates the drug if the patient be tuberculous. Not only does it tend to produce hemoptysis but it seems to activate latent foci and cause fever. Supersensitiveness to the product has been noted. The symptoms are those of anaphylactic reaction in general. The vasomotor nerve appears to be chiefly affected, and the symptoms are angioneurotic in character.

The action of arsenobenzol in syphilis has been described in such detail that it need not be repeated here, but a few words may be said concerning the very latest teachings.

To the former indications (syphilitica maligna, idiosyncrasy to mercury and cases refractory to mercury) may be added the prophylactic use, when there is a possibility of sterilizing quickly a recent focus of the disease, and the so-called nerve relapses, which yield more rapidly to renewed treatment with salvarsan than to other methods of management. The preceding are absolute. Of relative indications, one perhaps not dwelt on sufficiently is beginning metasyphilis.

Authors differ somewhat as to what cardiac lesions form a contraindication. Breitmann, who has made a special study of this problem, enumerates acute rheumatic endocarditis; myocarditis when severe (unless itself syphilitic); severe cardiac complications of affections in neighboring organs and in general conditions (goitre, Basedow's disease, advanced tuberculosis, emphysema, kyphoscoliosis, sclerosis of the coronaries (non-specific), severe nephritis, anemia, leukemia, diabetes); finally, in all uncompensated heart lesions.

In any condition with destruction of the hepatic parenchyma the drug is contraindicated, because the liver is the great disintoxicating organ, and would be unable to manage the arsenic.

In all acute nephritis (non-specific) salvarsan is contraindicated. In chronic nephritis with compensation the remedy is not necessarily contraindicated.

In severe metabolic disturbances—diabetes, obesity and chronic alcoholism—it is contraindicated at least as far as the intravenous method of usage is concerned. In diabetes it is absolutely contraindicated. In regard to the nervous system arsenobenzol cannot be used if any form of nervous degeneration is present, or in cerebral arteriosclerosis, even if specific, or whenever a Herxheimer reaction develops in a vitally important center.

What should be the procedure if a syphilitic patient comes for office treatment? Let us suppose that he has had no treatment thus far, and presents only the primary lesion. It is probably best to give him both mercury and salvarsan in combination. In this way his disease may proceed without symptoms and the Wassermann reaction may never develop. If the lesion is suitable for immediate excision so much the better. This step can be taken and the wound cauterized with the Paquelin. To give salvarsan in the absence of all evidence of syphilis is uncalled for (negative Wassermann, and no spirochetes in the primary sore). As soon as it has been decided that the specific drug is indicated, a fixed plan should be devised. It will doubtless be best to give the injections every third or fourth day until three or four have been administered, the dose to be 0.5 gram. Whether or not to use mercurials at the same time must depend on circumstances. As they do no harm it is doubtless safer to resort to them, either by inunction or injection. After four or five weeks serodiagnosis should be practiced. If this gives a positive result the treatment must take a new turn. Nothing more can be accomplished by forcing a cure, hence the treatment should be on the so-called chronic intermittent plan. During the first year the patient should receive treatment three or four times at regular intervals; during the second year twice, and during the third year once. If the chronic intermittent has become advisable mercurials should always be conjoined with salvarsan. The former should consist either of a course of inunctions or one of injections. But if the course of the disease is characterized by obstinate relapses no plan can be fixed in advance. In early tertiary or malignant syphilis salvarsan is especially efficacious. The more menacing the symptoms the more it is indicated. In such cases it is always well to push the iodides and local treatment.

When may we regard the disease as cured? After three or four years with negative Wassermann reaction throughout it is highly improbable that a relapse will occur.

A Finger Guard.

W. J. Manning, Washington, D. C., recommends a device he has found very practical and useful in all cases of contusions at the ends of the fingers or toes, as well as after amputations of these members (*J. A. M. A.*, March 2). It is particularly useful when cicatricial tissue is forming or has formed during the healing process. He uses two strips of tin or zinc., one-sixteenth to one-eighth inch wide and four inches long, approximately, which are bent in horseshoe form and placed over the end of the finger at right angles to each other and bound on by a strip of adhesive plaster covering the distal ends of the bars or lapping over them. A turn or two of gauze applied first will protect the finger from the edges of the tin or these may be covered with adhesive plaster. A space of one-eighth to one-fourth inch may be left between the end of the finger and the inside of the guard, through which the wound may be dressed from time to time. The whole may be enclosed in a bandage or the tin strips left exposed, as desired.

THE CORRELATION OF EPIDEMIC PARALYSIS IN ANIMAL AND MAN.

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Epidemiologists of the recent epidemics of poliomyelitis in man have not overlooked the coincidental paralysis and death among domestic animals, yet the aggregate of such occurrences has not hitherto, I believe, been assembled. Dr. Robert Lovett, on finding illness, paralysis or death among thirty-nine animals in thirty-four homes of the one hundred and fifty cases specially investigated, considers the relation of poliomyelitis to paralysis in domestic animals, a matter requiring much more extensive investigation as it "is at present wholly unknown." (Lovett. Infantile Paralysis in Mass. in 1910. *Bull. Mass. Board of Health*, June, 1910.)

A close relationship between paralytic cases in man and animal during epidemics of poliomyelitis has been observed in nine States of the United States, and in Sweden, Westphalia, and England; they are given with some detail in the following table:

ACUTE PARALYTIC DISEASE AND DEATH AMONG DOMESTIC ANIMALS OCCURRING COINCIDENTALLY WITH EPIDEMIC POLIOMYELITIS IN MAN.

REPORTED BY	LOCALITY	YEAR	HORSE	SHEEP	DOG	CAT	HOG	FOWLS	TOTAL.
Caverly	Vermont	1894	Horse		Dogs			Chickens	Many.
Wickman	Sweden	1905			Dogs				And other animals.
Free	Dubois, Pa.	1907					Pigs	Chickens	
Manning	Wisconsin	1907-08	Colts	Sheep		Cats		Ducks	Many.
Lovett	Massachusetts	1911			Dog	Cats		Hens	39 in all.
Hill	Minnesota	1909	Colts						Three.
Snow	California	1910	Colts		Dog	Cat		Chickens	Many
Kelley	Washington	1910			Dog paralyzed 1 week before onset in child.				
Williams	Wash., D. C.	1910						Chickens	Many
Bierring	Iowa	1910				Cat	Hog	Chickens	Many
King	Indiana	1911	18 animals (1 cow) paralyzed among 102 cases of poliomyelitis.						
Batte	Ohio-Ky.	1911						Chickens	
Krause	Westphalia	1910						Chickens	Many.
Gregor & Hopper	Cornwall, England.	1911	Horse, one week before onset of paralysis in boy.						
Carina	Sao Paulo, Brazil	1910-11	1,000 horses and 4,000 cattle dead with "symptoms of rabies," coincidental with 13 cases of human poliomyelitis at Sao Paulo.						

At Penryn, Cornwall, England, on May 27, 1911, a boy of 6 years of age was taken acutely ill; he was observed falling about the house; he went out and again fell and was carried home, and paralysis of all extremities followed. This was the second of 132 cases of paralysis in Cornwall and Devon, the adjoining shire, during the past Summer. One week before the boy's illness a horse belonging to this lad's father had an attack of what is locally known as "poke-neck;" it is said to have been paralyzed in the neck and forequarters; it fell down in the stable and was unable to rise; when taken out of the stable with assistance it again fell; it was shot without having been seen by the veterinary surgeon.

June 8, a lad of two and a half years became ill with a paralysis of both legs. The second boy's father had been in the house with the first case (Gregor & Hopper. Poliomyelitis in Cornwall, *British Med. Jour.* Nov. 4, 1911).

Reading of this report of coincidental paralysis in man and horse, occurring in the same homestead during a considerable epidemic of poliomyelitis, crystallized a belief that has been constantly augmented during four years' study of this disease. The season preceding the Wisconsin epidemic of 1908 I was asked to examine two recently foaled colts on the stock farm of Chas. L. Allen, of Eau Claire, Wis. These colts were affected with a spastic paralysis, all four legs sticking rigidly forward; when lifted to a foothold they could not stand. They were two of a considerable number of blooded colts that were lost that season. A young riding horse also developed a spastic gait and had to be disposed of. Preceding and during the epidemic among human beings, I witnessed a rapidly fatal epidemic among sheep on a sheep farm owned by the same gentleman; ducks on another farm (Larsen, Five Mile Dam), paralyzed and dead; and knew of the death of five cats in three families, four of which died after paralysis of some degree.

The paralysis and death of colts and young horses occurring coincidentally with epidemic paralysis has been reported in medical literature four times in the United States: Dr. Chas. S. Caverly, of Rutland, Vt., reporting the epidemic which occurred at and near Rutland in 1894 (132 cases) stated:

> During this epidemic and in the same geographic area an acute nervous disease paralytic in its nature affected domestic animals. Horses, dogs and fowls died with these symptoms. * * * a horse died paralyzed in the hind legs. Dr. W. W. Townsend, of Rutland, who made the examination of the horse reported that a section of the lumbar portion of the cord showed a granular degeneration and pigmentation of the ganglion cells of the anterior cornua, and atrophy of the anterior nerve roots. There was no meningitis (Caverly. AC. Ant. Poliomyelitis in Vermont *Jour. A. M. A.*, Jan. 4, 1896).

During the epidemic of 1,000 cases in Minnesota in 1909 three colts were seen by Dr. H. W. Hill, epidemiologist of the Minnesota State Board of Health, ill with a disease "strongly analogous in clinical history and symptoms to the disease in the human." (Hill, *Minn. Med. Jour.*, Sept. 1st, 1909.)

These colts were under the care of Dr. C. S. Shore, a veterinary surgeon of Lake City, Minn., who wrote of them the following excellent clinical record:

"In my veterinary practice of the past five or six years I have found a disease appearing among one or two year old colts that shows a line of symptoms corresponding closely to anterior poliomyelitis in children. I have had from five to ten cases a year during this time, always occurring during the Summer months, and the majority of them during the month of August. The affected colts are usually found in the pasture unable to stand. The owner will sometimes notice an unsteady gait for 24 hours before entire loss of motion occurs. At first the colts have a rise of temperature to 104 degrees; pulse and respiration accelerated; animal sweats profusely; there is some trouble noticed in swallowing, especially water; bowels tending toward constipation; more or less tympanites; retention of urine for a few hours at least. Head drawn back so the end of the nose tends to assume a position somewhat on the line with the neck.

The death loss is less than 10%, but in those that recover the market value is depreciated, because of faulty gait the animal assumes after an attack of the disease; there is atrophy and contraction of certain muscles or certain groups of muscles. It seems that the flexor muscles of the legs especially are more often affected than the extensor, and in almost all of the cases some of these deformities are likely to remain permanent, causing a flexion of the fetlock. The elevators of the head are also likely to become affected, causing the head to have a poky appearance as it is carried out from the body.

After one of these attacks the colt will remain down from one to three weeks, and will then continue to improve for a year, but it seldom if ever makes a complete recovery.

Dr. Shore's interesting note that the colts had difficulty in swallowing will be referred to again later. It is evident these colts were affected by the same disorder as the horse at Penryn, which died after developing poke-neck and paralysis of the forequarters.

The State of California had an epidemic of 100 known cases of poliomyelitis in 1910. The majority of these cases occurred in San Joaquin County, and according to the September, 1910,

Bulletin of the California State Board of Health, "veterinarians report a considerable number of puzzling paralyses of colts in San Joaquin County, where the largest number of cases have occurred so far."

To summarize the foregoing: An acute epidemic paralytic disease has coincidentally attacked man and the young horse in four separate States of the United States of America, in four separate years: Vermont, 1894 (one of the New England States); Wisconsin, 1907-8; Minnesota, 1909 (upper Mississippi Valley, 1,000 miles west of Vermont); California, 1910 (Pacific Slope, 2,500 miles west of Vermont).

In one instance, in Vermont, an autopsy on an affected horse with microscopical examination of the lumbar spinal cord demonstrated the characteristic degeneration of the motor area of supply of the paralyzed hind-quarters of the beast.

In what one particular do these four instances most closely resemble each other? Is it not that in each of these cases there were many human beings attacked in proportion to the animals affected? Could we learn of an epidemic where the plague first attacked animals in large numbers, before the ravage of the human family began, it would form a connecting link in this chain of evidence. Such a cattle plague of vast proportion is ravaging the coffee district of Sao Paulo, Brazil, and the past summer 13 cases of poliomyelitis have been recognized and reported among the children there. San Paulo's elevation gives it a temperate climate, and although remote it is in constant communication with its seaport, Santos, from which is shipped much of the world supply of coffee.

Carina reports from Sao Paulo an epizootic in cattle and horses causing the death of about 4,000 cattle and 1,000 horses. It has been prevailing for several years, but exclusively in a narrow strip of the country. The animals affected all die after a few days. (*Annales de Institute Pasteur,* Nov., 1911, Paris.)

There seems to have been a somewhat hasty conclusion that this epizootic was due to rabies, although Carina states there was no prevalence of rabies among dogs at that time. We may recall in Dr. Shore's excellent clinical history of the sick colts, the difficulty in swallowing he noted. Spasmodic pharyngeal paralysis affecting a sick animal is often considered sufficient proof of the presence of rabies; also we cannot ignore the curious and as yet unexplained clinical analogy between these two diseases, poliomyelitis and rabies.

C. Fereira reports that "poliomyelitis made its appearance in Brazil toward the close of 1909; there have been cases in Rio de Janeiro, and at least thirteen cases among children at Sao Paulo." (*Bull. de la Société de Pédiatrie,* Paris, Oct., 1911.) There is then strong presumptive evidence that poliomyelitis is epidemic in South America among man and animals, and that the disease is recognized only in its human manifestation.

Sheep. "In England paralysis is epidemic among sheep in the early autumn each year." (Shipley. Torment of Flies, Christ College, Cambridge.) It is well known that Sir Walter Scott was afflicted with a short and withered leg. He had an acute illness when he was a small lad which left him unable to walk, and he was given in charge of an old shepherd of whom he was very fond. This shepherd took the boy out in his plaiddie to the fresh air of the sunny hillsides, and health returned to him, but he was left with a paralysis of one leg.

In the fine study of the life of the English shepherds of today, W. H. Hudson relates the story of an ataxic sheep, told by the shepherd, Caleb Bawcome, who was himself the victim of poliomyelitis. The description of man and sheep is as follows:

> "Caleb, a shepherd of the downs. A very tall, big-boned, round shouldered man, uncouth to grotesqueness, who walked painfully with the aid of a stick, dragging his shrunken and shortened bad leg. * * * He told me that when he were a young man he was once putting the sheep in the fold, and there was one that was giddy, a young ewe. She was always turning round, and round, and round. And when she got to the gate she wouldn't go in but kept a'turning and a'turning 'till at last he got angry and lifting his crook gave her a crack on the head." He tells of other giddy sheep, "giddy because they had a maggot on the brain, or some other trouble I couldn't find out." He also tells of an unlucky farmer in those parts whose sheep fell sick and died in numbers, year after year, bringing him down to the brink of ruin. (A *Shepherd's Life.* W. H. Hudson, Pages 52, 127 and 352).

Here, then is a record of an epidemic sheep plague occurring annually; a very good description of an individual case of the ataxic type occurring in a young ewe; the shepherd presenting the typical flaccid paralytic type; and our knowledge of Walter Scott, the child of aristocratic parents, contracting the acute disease coincidentally with association with a shepherd.

Preceding the epidemic of poliomyelitis in Wisconsin, I witnessed a rapidly fatal epidemic among sheep on a sheep farm belonging to Chas. Allen of Eau Claire, Wis. This farm is on a small stream, the Little Elk; is well drained and located. One-third of a flock of some hundreds of sheep died, when the disease stopped spontaneously.

It is not to be forgotten that the great pandemic of the last decade had its inception in Scandinavia. It is impossible to ignore this fact in a comprehensive study of the genesis and transmission of poliomyelitis. Wickman reported that in Sweden many animals were apparently affected with poliomyelitis at the same time as children. (Wickman. Heine. *Medicinsch. Krankheit,* Berlin.

Flocks of sure-footed sheep and goats are the domestic animals found on the farms of the precipitous valleys of North Norway. A photograph of one of these almost inaccessible "eagle's nest farms" shows the children tethered out for safety on the mountain side. (Daniels. *Home Life in Norway,* 1911.) H. K. Daniels, after years spent among the Norwegian peasantry, says that in one such valley, with granite walls standing sheer three thousand feet high, tenanted by half a score farmers who subsisted on the breeding of a few sheep and goats, the sun did not shine on his dwelling for four long winter months. (Ibid, p. 199.) His notes which relate to the subject concern the poor nutrition of the up-country peasant, due to an inadequate diet of salt fish and salt meat, and the catarrh generated by inadequate ventilation, a temperature of 100 degrees being maintained in the living rooms of the moss-caulked dwellings when the outside temperature is below zero. (p. 229.) There is also a photograph of an interior showing two box beds built into the wall from the floor to the ceiling of the room. (Ibid, p. 248.)

Pigs and Chickens. The reports of paralyzed fowls from districts where poliomyelitis exists are common, and call to my mind a number of similarly affected hens I saw some years ago on the John Seymour ranch in Allen County, Kansas. The housewife reported the death of a hundred hens from an epidemic disease, and called my attention to one of those remaining which crouched on the ground, and when disturbed fluttered a short distance dragging its feet. Other of the fowls were unable to use one wing; many chickens whirled wildly about until they fell dead. The epidemic was clearly an acute nervous disorder, producing ataxic and paralytic types.

Examination of Paralyzed Chickens.

(a) Dr. Charles L. Dana examined one of the fowls paralyzed during the Vermont epidemic of 1894, and found, "an acute poliomyelitis of the lumbar portion of the cord; no meningitis; bacteriological examination negative." (Caverly. loc. cit.)

(b) Dr. F. A. Ely examined a paralyzed chicken with a most suggestive history from a Boone County, Iowa, farm. The chicken had an acute illness not exceeding three days in duration, and one wing and both legs were paralyzed. During the Summer many of the chickens on this farm became ill and disabled, and as soon as this was noticed the farmer would snap off their heads and throw the chickens into the hog-yard. Some time later a large hog developed a typical paralysis of both hind legs, so that the animal wore the skin off his knees as he dragged himself about. In October, 1910, Dr. Ely saw in consultation, a child with acute poliomyelitis on this farm; at the same time of Dr. Ely's visit, another case of paralysis was

observed in a chicken which was taken to Des Moines for examination.

Dr. A. R. Robertson, Pathologist at Drake University Medical School reported: Examination of fowl paralyzed after three days' acute illness (one wing, both legs). Upon exposure of the spinal cord, a distinct area of softened cord, one inch in length, of the lower dorsal and upper lumbar regions was observed. Histological sections from the affected areas revealed numerous small hemorrhages in the anterior cornua, and distinct collections of cells in peri-vascular and peri-lymph channels, and tissue spaces of the anterior horns. The histological picture was that of acute poliomyelitis in man (Bierring. Acute Poliomyelitis in Iowa in 1910-1911. *Interstate Med. Jour.*, Jan., 1912).

At Pella, Marion County, Iowa, one hundred and fifty miles distant from the Boone County case, a similar association between a paralytic disease in chickens and cases of acute poliomyelitis was noted. A number of these chickens were obtained. Three of them were kept for two, three and four weeks, until the paralysis and a certain degree of muscular atrophy were established, and then examined, with confirmatory results (Bierring. loc. cit).

In September, 1911, five cases of acute poliomyelitis in Calhoun County, Iowa, three of which proved fatal in the first forty-eight hours, occurred on four different farms. On the farm of each of four of the cases a history of paralytic disease in lower animals was obtained. In two instances chickens were affected; kittens at one farm, pigs at another (Bierring. loc. cit).

Have we other evidence of the simultaneous appearance of a plague affecting man and the domestic animals? To answer this question, we must ask the distinguishing characteristics of poliomyelitis? Are they not:

I. Nervous manifestations, including paralysis.

II. A high mortality rate, especially high among sucklings. Two epidemics simultaneously affecting man and animals, one of which presented the first of these characteristics, that of an acute nervous disease, the second of which presented the characteristic of an appalling mortality among children, are known to history.

At Echternach in the Luxembourg there is an annual dance through the church, of pilgrims, headed by the clergy, to the shrine of St. Willibrod. The pilgrimage is done by way of vows for the cure of nervous diseases. The local legend asserts that the ceremony had its origin in a cattle plague which began in the eighth century, which ceased through an invocation to the Saint. The dance is headed by the clergy and proceeds to a traditional tune from the banks of the Sûre to the church, up sixty-two steps, along the north aisle, around the altar with the sun, and down the south aisle. It is curious that until the 17th century only men took part in it. (*Medieval Stage*. E. K. Chambers, 1911. Vol. I, page 163.)

A knowledge of this plague, simultaneously affecting animals and man with an acute nervous disease, re-appearing at irregular intervals through the ages, and ceasing (?) on an invocation to the saints after all the susceptibles had been killed or crippled and an immunity established for the rest of the inhabitants, sheds a flood of light on the so-called miracle cures of the middle ages and to-day. A thousand pairs of crutches might well adorn the walls of a church which could cure (?) paralysis of the legs, but it is to be feared the cure was inoperative where the paralysis was not regressive in type.

The other epidemic in history occurred when the death of the first-born in Egypt followed a murrain of cattle. The clinical points established in this brief statement are the simultaneous plague of man and animals, and the striking mortality among very young children. The clinical facts omitted would refer to the individual cases of paralysis and disability in those who remained alive. Such a case is well described in the life history of Mephibosheth, who sat at the king's table all his days because he was lame in both his feet, and goes to show that the Hebrew race did not escape the contagion, though they shook the dust of Egypt from their feet.

Frequent epidemics of paralytic disease occurring coincidentally with human poliomyelitis may indicate that man is not the essential host of this disease. It is well known that poliomyelitis has been artificially transmitted to monkeys and rabbits by many investigators, and according to Flexner "we possess evidence that certain of the lower animals, among them poultry, the dog, and possibly the horse, are subject to poliomyelitis." (Flexner. Poliomyelitis. *Jour. A. M. A.*, Sept. 24, 1910.)

The efforts to transmit the disease artificially to the horse, sheep, dog, cat, hogs and fowls have been unsuccessful.

As approximately 50% of the cases among human beings occur among children less than five years of age, and the heaviest mortality is among yearlings of the human family, it might follow that the infant animal is more susceptible than the adult.

Improved Esophagoscope.

After noticing the prominent facts in the history of esophagoscopy, W. Lerche, St. Paul (*J. A. M. A.*, March 2), enumerates as, in his opinion, the essential features of a practical working esophagoscope the following: (1) simplicity of construction; (2) ease of introduction without an obturator; (3) the source of illumination must be as near as possible to the object to be examined and so arranged that when instruments are introduced into the tube the rays of light are not intercepted; (4) by some simple contrivance that can be easily operated the field of operation must be kept constantly dry so as to enable rapid work and prevent undue length of the operation. He describes and illustrates an instrument which, in his view, includes, as far as possible, these requisites. From his experience with several hundred esophagoscopies with different instruments, he believes that the light for the work is best situated at the distal end. The objection that it may break into the stomach is practically negligible, as the chance is so remote, and the other objection, that it may be easily soiled by blood or mucus, has been overcome in his instrument by having a movable suction-tube, so long that it can be pushed beyond the lamp. Furthermore, by connecting the suction-tube with a Chapman suction-pump the field of operation is constantly kept dry. Another advantage is that the instrument is always introduced without an obturator under the guidance of the eye, so that the entire tract through which it passes can be inspected. The introduction of the instrument is easy and the method is detailed. He always uses a dry-cell battery for the lamp. The street electric current should not be used whenever the instrument is connected with the water faucet. Three tubes are required, two 10 mm. in diameter and 50 and 25 cm., respectively, in length for adults and one 8 mm. in diameter and 35 cm. long for a child.

Paraldehydism.

W. Hartz, Carthage, N. Mex. (*J. A. M. A.*, March 2), reports a case of chronic paraldehyd poisoning, the drug having been taken on account of persistent insomnia. At first one fluidram sufficed, but the patient increased the dose gradually, so that he took on the average two fluidrams daily. After each such dose he felt intoxicated, this being followed later by a state of pleasant contentment with pleasant recollections and exhilaration. He had not noticed any ill effects on the stomach from its use, but there was a tendency toward looseness of the bowels. It is later stated in the account that a sound sleep would generally follow the taking of six or eight fluidrams of the drug, and on awakening his head would be clear. The objective symptoms were restlessness, tremor, cyanotic condition of the hands, congestion of buccal mucosa, dry, coated and fissured tongue with fine tremor. There was marked evidence of existing arteriosclerosis. The insomnia was persistent and resistant to powerful hypnotics other than paraldehyd. The patient appeared much older than his actual age, which was 47. The author has found but three other cases reported in the literature.

A STUDY OF INDUSTRIAL DISEASES.

Of a population of 100,000,000 in the United States, fully one-third earn their livelihood by the veritable sweat of their brows. In other words, nearly 35,000,000 are engaged in industrial labor. It is therefore to be recognized that distinct groups of diseases, injuries and death causes are to be found among industrial workers.

The diseases are typically occupational. The miner suffers from pulmonary diseases superinduced by inhalation of dust. The steel worker has the same difficulties due to breathing the minute particles of metal that fly in the air of foundries.

Dust is a pregnant cause of disease among many factory workers, such as those in textile shops, flour mills, dye works, stone works and the like. Gas and fumes from coal, petroleum, coke, acids, dyes, gasoline, aniline vapors cause distinct injurious symptoms.

Workers in metals and their salts suffer from phosphorus, lead, arsenic, tin, bronze, mercury, brass and zinc poisoning.

Vapors affect men in the chemical industries, such as in the manufacturing of cement, chlorine, bleaches, copper, glass, gold, silver, lead, different acids.

Intense heat in different shops causes dermatological conditions. Excessive light in many lines of endeavor brings about diseases of the eye.

Each particular industry has its own distinctive injuries. Some lines are more hazardous than others. In mining caveins, falling coal and fire damp are the most common causes of injury and death. Between the years of 1898 and 1910 over 30,000 miners were killed and 80,000 injured in the United States. In the year 1910 there were more than 35,000 deaths from industrial accidents, while over 500,000 more men were injured during the same time. This is 250,000 more than the killed and wounded during the entire course of the Russo-Japanese war. Indeed more men are killed and maimed on American railroads each year than the Boers and English lost during their three years' fighting.

Dr. Josiah Strong, of the Institute of Social Service, estimates that the casualties in this country each year are equal to the average annual casualties of the War of the Rebellion, the war in the Philippines and the Russo-Japanese war combined. Figures vary in different countries. The American mortality is higher in industrial occupations.

The Prussian Government recently published some statistics in regard to the mortality in the single trade groups on the basis of the census of trades for the year 1907 and the official statements regarding the occupation of those who died in the years 1906 to 1908. According to the figures of the *Jour. A. M. A.* on German occupational mortality, the most unfavorable mortality (14.25 per 1,000) of the male workers is shown by commerce. Agriculture is only a little more favorable (14.01), while industry has the extraordinary advantage of only 11.50 per 1,000. This picture is altered, however, if in place of the entire mortality, that for the various ages is considered. Looked at in this way, agriculture presents the most favorable conditions at all ages; the mortality of persons engaged in industry is about 15 to 25 per cent. higher at the ages from 15 to 40, and at older ages about 40 to 50 per cent. higher than in agriculture. Transportation and commerce show still more unfavorable figures. As for example, the relative figure for the ages of from 30 to 40 years is 7.85, while that of those engaged in industry is only 6.32 and of those in agriculture 5.14; in the same way in the age group of from 40 to 50, the relative rate is 14.02, as compared with 11.71 and 8.60. To a considerable extent, these unfavorable figures are due to the liquor trade (Beherbergung und Erquickung), which is found in this group and which is characterized by a high mortality.

Of the single industrial trades, the stone and earth industry presents the most favorable figures, probably because it is a summer trade, so that those who have died in winter are reckoned in other callings. In mining, the younger classes show a most unfavorable and the older a more favorable figure than industry in general. The cause of this is not easy to ascertain. It is possible that there is a gradual selection of the fittest. The metal trades appear to be more favorable in all age groups, and the machine industry more favorable than the total of the industrial trades in general. Quite as favorable, partly even more favorable, is the position of the chemical industry. The textile trades by no means show the high mortality that would be expected. The most unfavorable is the clothing and cleaning trades, probably because this is a field of domestic industry with insufficient remuneration. The building trades show until the age of 30 a more favorable and after that a more unfavorable rate. The foodstuffs industry has the average rate until the age of 40 and later a somewhat higher mortality.

The Germans recognize the economic importance of industrial disease and are doing everything possible to safeguard German workmen. Insurance of operatives against illness and injury is obligatory and statistics from German sources may be regarded as authoritative.

Applying the results of German statistics to American conditions Prof. M. Allen Starr of Columbia University has worked out this table:

ESTIMATE OF SICKNESS AND ITS COST AMONG OCCUPIED MALES AND FEMALES IN THE UNITED STATES, 1910 (33,500,000).

(a)	Estimated number of cases of sickness, on the German basis of 40 per cent. of the number of persons exposed to risk	13,400,000
(b)	Estimated number of days of sickness on the German basis of 8.5 days per person per annum.....	284,750,000
(c)	Estimated loss in wages at an average of $1.50 a day for 6-7 of the 284,750,000 days	$366,107,145
(d)	Estimated medical cost of sickness at $1 a day for 284,750,000 days.....	284,750,000
(e)	Estimated economic loss at 50 cents a day for 6-7 of the 284,750,000 days	122,035,715
(f)	Total social and economic cost of sickness per annum	772,892,860
(g)	Estimated possible economic saving in the health of individual workers on a basis of 25 per cent. reduction per annum	193,223,215

For more than 20 years Great Britain, Germany, Austria, Italy and France have recognized that industrial disease is of sufficient importance to warrant study by governmental experts. In those countries all industries are carefully inspected by trained officials and defective methods are remedied. Preventive measures have been adopted and dangerous machinery eliminated or properly guarded. As a result there is a bond of sympathy, based on humanitarianism, between employer and employe. Efficiency has been increased and the percentage of industrial illness reduced.

Despite this advanced movement abroad, nothing was done in this country to further such an idea until June, 1910, when a Conference on Industrial Diseases was held in Chicago. As a result of this meeting a memorial to President Taft was drawn up and individual States are commencing to take up the subject.

John B. Andrews, secretary of the American Association for Labor Legislation, reports to the *Jour. A. M. A.* that six States —California, Connecticut, Illinois, Michigan, New York and Wisconsin—enacted laws requiring physicians to report cases of occupational disease. These diseases usually specified are anthrax, caisson disease, lead, phosphorus, arsenic and mercury poisoning. In Wisconsin, anthrax is omitted, and in Illinois the law is not quite clear in every respect, but seems to cover the usual disorders. In most cases the notification is to include the name, address, place of employment and disease of the patient. Michigan requires, in addition, the length of time of such employment, and in New York such other information as may be required by the Commissioner of Labor. In every State but Connecticut there is a penalty for failure to report, but only in California and Connecticut is a compensation given

for reporting. This pioneer legislation is the result of an attempt to excite interest among medical men, and for this purpose a tentative bill based on twelve years of English experience was introduced into eight State legislatures. In Minnesota action was postponed after it had been passed in one house, and in Pennsylvania it was vetoed on account of an amendment considered to be unconstitutional. In New York the physician, attending or called to visit a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, or mercury, or their compounds, or from anthrax, or from compressed air illness contracted as a result of the nature of the patient's employment, must report such cases to the Commissioner of Labor. A fine not exceeding ten dollars is prescribed for failure to make such report.

Poisoning from metals is one of the commonest forms of industrial disease and the symptoms of lead colic, palsy and tremor are noticeable, even to the untrained eye. In the smelting of lead ore, in the manufacture of red and white lead, in the use of paints, in the printing trade, in file cutting, in enameling, in the manufacture of china and earthenware, in glassmaking and in all work where paint is used, such as carriagemaking, shipbuilding, or house decorating, and among plumbers, the exposure of the laborer is constant.

While such cases are apparent and can therefore be treated there are symptoms such as chronic headache, impairment of vision, neuritis and mental and physical deficiencies which many times are not traced to the proper causative source. England, far ahead of America in this matter, reduced the cases of lead poisoning 50 per cent. between 1899 and 1906 by taking up the subject intelligently and treating it acordingly.

Layet states that in France 138 industrial processes involve the use of lead, and Dr. Alice Hamilton states that in Illinois there are 70 industrial processes in which lead or its salts are handled which have caused lead poisoning. She found cases of lead poisoning in 33 out of 56 establishments where lead was used.

In 1909 a law was passed in France making it obligatory to abandon the use of white lead in all paints after 1914, and to enforce the use of oxide of zinc in its place. Similar laws have been passed in Italy, Germany and Belgium during the past two years. The United States lags behind and many States are not even considering industrial diseases and accidents in any way.

A writer in the *Medical Record* says that "of two factories engaged in the production of white lead in one of the Central States, one, in which no effort was made to safeguard life, although employing only eighty hands, was compelled to renew virtually the entire working staff every ten weeks; the other, conducted on principles of humanity and civilization and employing twice as many hands, took on less than 100 new workmen during the year."

Dr. Alice Hamilton states (*Jour. A. M. A.*, Apr. 29, 1911) that in 1910 in England, under the rules already mentioned, out of 1,320 persons employed in white lead works in Newcastle-on-Tyne only five cases of poisoning were reported; while out of 450 persons employed in Illinois 63 cases were reported, i. e., one in every seven.

In lead smelting works, she says that almost all the operatives become poisoned sooner or later if they remain at work more than a few months. This was formerly the case in Germany, but while there in 1885, with no regulations, 73 per cent. of workers were poisoned, in 1892, under regulations, only 0.8 per cent. were affected.

Laureck (Weyl *Handbook D. Arbeitenkr.*) states that in Austria in lead-producing factories in 1886 43 per cent. of the operatives suffered from poisoning, while after governmental supervision had been instituted in 1892 but 6 per cent. were affected. He also shows that 71 per cent. of all cases of lead poisoning occur in Winter and but 29 per cent. in Summer, a fact which proves that free ventilation and plenty of fresh air are a great preventive of such diseases.

State supervision would lessen our percentage of lead poisoning enormously within two years.

Teleky (*Deutsch. Zeit. f. Nerv.*, Vol. 37, 1909, by *Interstate Med. Jour.*) shows that the muscles used by the worker in lead, either excessively or exclusively, are the ones that are paralyzed by the lead. In painters the pronators and extensors are affected most frequently; in other workers similar conditions were found, so that from a large material and a careful analysis of individual cases he comes to the conclusion that lead has very little selective action as such; that the picking out of individual muscles or muscle groups to the nerves supplying them is practically always due to the over-use of these muscle groups; and that the muscles which are most strongly and frequently used are the muscle groups that succumb most readily to lead poisoning. F. W. Mott (*Arch. Neur. and Psych.*) describes a condition which closely simulates that of dementia paralytica. He finds the blood-vessel walls of the artery and veins degenerated, hemorrhages scattered throughout the brain filling in the perivascular spaces. The neuroglia is increased both in the white and in the gray matter. It is interesting to note that in this case of Mott's the patient was in a delirious condition closely approaching the clinical picture of lead psychosis. The changes that are found in the case are so suggestive of dementia paralytica that it seems to support the contention of certain German neurologists that lead does not produce any special form of insanity, but that the majority of cases are real paretics. Another interesting fact of this study is that the chemical examination of the brain showed no traces of lead.

Kehrer (*Zeit. f. g. d. Neur.* III., Heft 4) gives an interesting description of the cases of two painters, one fifty-two years of age, the other twenty-five, who worked with oil colors, and were both acutely affected with psychosis. He calls special attention to the recent differentiation between lead meningitis and lead encephalopathy. The following four forms are recognized: First, a latent variety recognized only by the findings in lumbar puncture, lymphocytosis and increase in pressure; second, incomplete appearing with colic, shown by headache, vomiting and increase of reflexes; third, an acute or subacute precocious form found especially in young individuals, a meningitis symptom complex, epileptic form, a delirious symptom complex; fourth, a late developing acute or subacute form recognized by headache, vomiting, slowing of the pulse and paralytic symptoms. The conclusion to which this author has come is that on account of the great varieties of psychical symptoms found in lead poisoning there is no characteristic symptom complex. Lead of itself can cause any kind of physical disease and can be considered in the words of Beer as metallic narcotic and stands in similar position to that of alcohol.

Shrumpf and Zabel (*Arch. f. Exp. Path.*, lvxiii, 1910) take up the subject of lead poisoning in typesetters, and bring out the interesting fact that a true lead intoxication is seldom met with in this profession, although lead poisoning is frequent enough. On acount of the alloy used, an antimony poisoning follows, especially found in youthful workers; after the thirtieth year it is seldom found. The usual symptoms are nervousness, irritability, insomnia, generalized fatigue, vertigo, headache, pain along the muscles or nerves, intestinal disturbances, definite lessening of leucocytes, eosinophilia, lowered blood-pressure, antimony in the stools. Prognosis is usually good. It is well to remember that the statistics of lead poisoning in typesetters are probably incorrect on account of the prevalence of the antimony poisoning in that class of workers.

Arsenical poisoning is common. Dr. Starr is authority for the statement that "of forty-two samples of furs recently examined by an American chemist in New York, eleven were found to be heavily loaded with arsenic, reaching 170 grains to the square yard. Such furs are dangerous to the wearer."

In 1899 a widespread epidemic of arsenic poisoning occurred

in England, which was traced to the beer manufacturered in Salford and Manchester. This beer was brewed by the aid of "invert sugar" or glucose, a substance in the preparation of which sulphuric acid is used. This acid was the source of the arsenic, it having been made from arsenical pyrites instead of from iron pyrites. Examination showed that the glucose contained 4 parts of arsenic to 10,000 parts, and that the beer contained from 0.14 to 0.28 grains of arsenious acid to the gallon. Hundreds of persons were affected, many being paralyzed for months.

Mercurial and phosphorus poisoning are of frequent occurrence among workingmen wherever these poisonous substances are employed. "Phossy jaw" is not infrequent among those engaged in the manufacture of matches. A writer in the *Medical Council* thus characterizes the disease: "Phosphorus necrosis, or 'phossy jaw,' an incurable disease, relieved only by curettage of the infected bone, or more or less extensive excision of the maxillæ. It is occasionally necessary to remove the entire jaw, and even then recurrence is the rule.

"The horrible, cadaverous odor of putrescence makes of the victim of "phossy jaw" a leper, in truth—a thing unclean—the grotesque disfigurement and the humiliation caused thereby compel his segregation with his fellow victims, as completely as may be. Cases of nine years' duration are not infrequent."

The Esch bill, which places a prohibitive internal revenue tax on matches made with poisonous phosphorus, has just passed both houses of Congress, and as soon as the effect of such a law is felt, cases of "phossy jaw" will rapidly diminish.

Other forms of industrial disease are sulphide of carbon poisoning, most noticeable among rubber workers, caisson disease, bends, writers' and telegraphers' cramps, diseases caused by dust and those common to electrical and chemical workers.

Dr. C. L. Dana (*Med. Rec.*, March 9), in discussing occupational neuroses groups them under four headings:

1. Occupational pains and symptomatic cramps.
2. Occupational neuritis and atrophy.
3. The acroparesthesias.
4. The true occupational or professional cramps.

In the clinical study of 100 cases he found 23 genuine occupational cramps, 20 brachialgias and 10 each median and ulnar neuritis. He found that writers, telegraphers, stenographers, musicians and artists were most frequently affected, and among the unskilled workers, pressers, ironers and tailors were in the majority. He finds that the "great mass of industrialists work with machinery or simply dig and delve, fetch and carry. They have no occupational neuroses except such as are due to accidents and bad living."

Before concluding it may be well to glance at Germany's method of caring for its industrial injured.

Since that progressive country took up the scientific study of industrial conditions, injuries and diseases, 21 years ago, over one billion five hundred million dollars have been paid to ill and injured workingmen.

Germany has industrial insurance, says C. H. Jaeger (*Am. Jour. Surg.*, March, 1912), against sickness, accident, invalidism and old age. All persons regularly employed in factories, mines, on railways and in other industrial concerns, shop assistants, employes in State services, employes of lawyers, etc., overseers, engineers, etc., must be insured, while those intermittently employed, those in dependent positions, employes of the empire (army and navy), etc., who are otherwise entitled to pensions and free medical aid, are exempted. Other persons, like servants, children, etc., may or may not be insured.

A workman whose wages are $6 per week pays 12 cents a week insurance. If ill he receives $3 and medical attendance and medicine. He can receive this amount for 13 weeks. The funeral indemnity is not less than $20.

Accident insurance, obligatory upon all employes receiving less than $7.50 per week, is met by employers. Compensation begins 13 weeks after the accident, the sick fund caring for the injured man up to that time. In case of fatal accidents one-fifteenth of the yearly earnings is paid, with a minimum of $12.50 and a pension to the widow till death or remarriage of 20 per cent. of the earnings, and also to every child up to the fifteenth year. Invalidism and old age insurance subjects to compulsory insurance after sixteen years of age all persons regularly working for wages in every branch of trade, managing officials and commercial assistants with regular salaries up to $500. This insurance fund is formed by equal contributions from employers and employes, and an imperial subsidy amounting to $12.50 per annum is granted to every annuity.

Germany safeguards the health of its workmen by teaching them sanitation, hygiene of the house and general hygiene and also by providing institutions where the diseased body can be treated by mechanical means through the use of machines designed for the gradual moving of the joints and gentle exercise of the muscles.

They are so scientifically constructed that the joint to be moved works in the exact physiological line. They are capable of such delicate adjustment that the most tender joint or weakened muscle can be placed in the machines and made to work without pain or effort. When the patient is powerless to make any movement a motor can be attached which passively moves the patient's joint.

There are machines for flexion, extension, stretching, turning, kneading or vibration. Special machines have been constructed for each joint, and for every normal motion of each joint. They range from the smallest motions of each individual finger joint to the widest range of the hip or spine.

Over a thousand German hospitals possess these machines and more than 350,000 people are treated every year. In New York six hospitals are equipped with mechano-therapy machines, a distinct contrast.

Germany, in many lines, possesses the finest workmen in the world. None are better treated or cared for. Over 11,500,000 are insured against illness, 14,000,000 against invalidism and old age and over 18,000,000 against accident.

Our own National Civic Federation in urging uniform legislation is formulating a bill which can be adopted by all the States and it is also emphasizing the necessity of Federal laws made applicable to interstate commerce.

As a result of the Wainwright commission's work in New York, a bill was passed by the New York Legislature providing that in certain hazardous employments injured workmen should be reimbursed by their employers. This bill was declared unconstitutional by the Court of Appeals and another bill, overcoming the objections raised by the court, will be introduced.

Commissions are considering employer's liability and workmen's compensation in the States of Colorado, Connecticut, Delaware, Iowa, Massachusetts, Michigan, North Dakota, Pennsylvania, Texas and West Virginia.

Two great corporations, the United States Steel Corporation and the International Harvester Corporation, have consummated plans for compensating injured employes. For example, the Steel Company pays twelve months' wages for the loss of a hand, eighteen months' wages for the loss of a foot, not over $3,000 for death, with from eighteen to twenty-four months' wages, depending on length of service and size of family and $100 for funeral expenses.

The Harvester Company pays: For death, three years' wages, but not less than $1,500 or more than $4,000. For a hand or foot, one and a half years' wages. For both hands, or both feet, or one of each, four years' wages, but not less than $2,000. For one eye, three-fourths the yearly wage.

The Brewers' Association is arranging with the union of brewery workmen, representing 70,000 men, to pay these amounts: For death, about four years' wages, but not more than $3,400. This is to be paid irrespective of assumption of risk, contributory negligence or fellow-servant liability. First aid is to be provided for all injuries. For total disability, sixty-

five per cent. of wages for five years. For temporary disability, sixty-five per cent. of his wages after the first week, unless disabled for more than four weeks, in which case he will receive compensation for the first week also.

Not until the American people recognize the necessity of protecting the great working classes against preventable dangers can we be doing our full duty as humanitarians. The subject of industrial diseases and accidents is in its infancy here, but when its importance is recognized we may expect to see the United States take its proper place with others of the great, enlightened nations in the conservation of the life and health of its industrial toilers.

Disease Capitalized.

The economic cost of disease is terrific. If we could compute the expense of the multitudes of ailments of mankind the figures would be appalling. War would be trifling as compared to the billions which can be charged up to disease.

As a mere incident, which could be multiplied thousands of times if conditions were studied similarly in the different parts of the world, extracts are quoted from an article by Drs. E. A. Locke and Cleveland Floyd of Boston (*Jour. Outdoor Life*, March, 1912), on the actual financial loss and the cost of institutional care in the cases of 500 male tubercular patients in the Consumptive Hospital in Boston. Of these 256 patients were alive and 244 dead and 41 per cent. were between the ages of 20 and 39.

They say: "It was found on May 1, 1911, the date of the investigation, that the 244 dead men had each lost on an average of 58.03 weeks of work from the time of the onset of their disease until death. The average weekly rate of wages of these men was $11.89, and their total loss in wages amounted to $170,965. The 256 living cases each lost on an average 89.3 weeks of work at an average wage of $11.38, or a total loss of $255,074, making $426,039 lost in wages alone by both groups.

"In addition to this large sum, it cost the city of Boston $73,984 to care for these 500 men in its public hospitals and other institutions. This community loss is exclusive of the large sums that were spent by private organizations on 406 out of these 500 cases."

"The direct result on the family income of the disability of the chief bread winner is well shown by the comparison of the total and average weekly income of the 422 families before the onset of illness and after the beginning of the stage of complete disability. In the first instance the total weekly income from all sources was $6,807.29, or an average of $17.50, while in the latter the total weekly income was only $3,055.60, or an average of $7.86, a decline of 65 per cent. One hundred and sixty-one families were without income of any sort during the period of complete disability of the patient, while the total weekly income previous to this stage was $1,877.75."

The authors then suggest that to the losses as stated be added "the capitalized value of the earnings cut off by death," making a loss of nearly $2,000,000 for the 244 dead cases. This, the *Boston Medical and Surgical Journal* believes, "verges on economic fallacy."

THE PASSING OF JOHN H. MUSSER.

In the death of Dr. John H. Musser, of Philadelphia, the medical profession loses one of its most brilliant and accomplished members. His long years of service as professor of clinical medicine in the University of Pennsylvania gave him remarkable opportunities for coming in close contact with medical students and practitioners, and upon these men he stamped indelibly the imprint of his manliness, kindliness and his remarkable abilities as a physician and teacher.

Dr. Musser came of a medical family, his great-grandfather and grandfather having been physicians, and now his mantle has descended upon his only son, Dr. John H. Musser, Jr.

His medical career in Philadelphia from his graduation from the University of Pennsylvania in 1877 to the day of his death was one of steady progression. He was dispensary physician, pathologist and visiting physician consecutively to the Presbyterian Hospital of Philadelphia; registrar, chief of the medical dispensary and physician successively to the Hospital of the University of Pennsylvania, holding in these institutions at the time of his death the last positions named. He was twenty years physician to the Philadelphia Hospital, resigning to become consultant of that institution. In the hospital work his studies were chiefly along lines of morbid anatomy and diagnosis.

He was consulting physician to the West Philadelphia Hospital for Women, the Women's Hospital, the Philadelphia Hospital, the Germantown Hospital, the Jewish Hospital, the Chestnut Hill Hospital, the Rush Hospital, and various homes of a charitable character.

As teacher Dr. Musser began as quiz master, later demonstrator of clinical medicine, associate professor and then professor of clinical medicine in the University of Pennsylvania. He was also director of the Department of Research Medicine in the University. He was offered the professorship of medicine a year ago, but he declined it on account of the pressure of a wide private practice.

Dr. Musser was a prolific writer. He was the author of a Medical Diagnosis and of articles in Hare's System of Therapeutics, and of the article on Pneumonia in Osler's System of Medicine. He was editor of the volume on Diseases of the Lungs, Nothnagel's Encyclopaedia, and editor with Dr. A. O. J. Kelly of a System of Therapeutics. He was also a valued contributor to medical journals.

Dr. Musser did not belong to Philadelphia alone. The entire country claimed him, and his fame as a diagnostician was practically world wide. As president of the American Medical Association in 1904 he gave that great organization a wise administration.

Aside from his local medical honors Dr. Musser had many foreign and American medical affiliations. He was a member of the Sixth International Anti-Tuberculosis Association, Honorary Fellow of the Institute of Hygiene, London, First Lieutenant of Medical Reserve Corps, president American School Hygiene Association in 1909, honorary member of the Budapesth Royal Society of Physicians, Vice-President of the Pennsylvania Society for Prevention of Tuberculosis, president of the National Medical Library Association in 1910.

Dr. Musser was a member of the Board of Trustees of the Drexel Institute of Philadelphia, and of the Phipps Institute for the Study of Tuberculosis, representing the Faculty of the University of Pennsylvania in that board. He was a member of the Board of Managers of the University Settlement House, president of the Pathological Society from 1893 to 1897, president of the Philadelphia County Medical Society, 1899; president of the Philadelphia Medical Club, member of the National Geographical Society, honorary member of the South Carolina Medical Association, the Virginia State Medical Association, the New York State Medical Association, and the Academy of Medicine, Harrisburg.

He was also a member of the Board of Trustees, the Bureau of Municipal Research of Philadelphia, a member of the American Association for the Advancement of Science; fellow of the College of Physicians, Pennsylvania State Medical Society, Association of American Physicians, American Climatological Society, Philadelphia Neurological Society, Pathological Society and Historical Society. Franklin and Marshall College made him a Doctor of Laws several years ago.

Dr. Musser started social service work in the Hospital of the University of Pennsylvania and Tuberculosis Classes in the Presbyterian Hospital. His death leaves a wide gap in American medicine.

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LABOR AND ITS DUTY TO LABOR.

Industrial diseases are arousing the attention of physicians, social welfare workers and labor leaders. Slumbering for years after Europe had recognized the vital importance of the question, we are tardily shaking off our lethargic sleep and realizing that the laboring man is entitled to the rights and benefits which shall insure to him a safe and cleanly place in which to work and protection against illness and injury as far as possible.

In another column industrial diseases are discussed at length. The article brings home the fact that a great problem confronts us and the question is on the best methods of remedying the existing evils.

The burden is upon the laboring man himself. Labor in the abstract in this country is intelligent. Many of its leaders are far-sighted, broad-minded men, who are honestly serving their fellow workingmen. The demagogues are fast being relegated to the rear.

If labor were a unit in demanding remedial legislation, based upon the 20 years' experience abroad in the prevention of disease and accident among workmen, the question readily could be solved. The labor unions should teach their members the meaning of prophylaxis against disease—the miner against the inhalation of dust, the chemical worker against noxious fumes, and the metal worker against poisoning. Well directed knowledge in these matters would prevent an enormous amount of illness.

Each State should have a rigid system of inspection by experts, so that every industrial organization could be thoroughly inspected and the courts given the authority to compel the introduction of such changes as would in the minds of competent men add to the welfare of the employes.

Machinery should be equipped with all possible safety devices, and factories thoroughly ventilated and poisonous gases and dust carried out of the building through proper channels.

Some forms of accident and sick benefit insurance are already factors in many industrial institutions. They should be extended, so that every worker would be protected against illness and injury.

We are not ready for compulsory insurance and may never be ready for old age insurance with governmental assistance, but every workman should guard his life, limbs and health voluntarily.

While the sovereign state must pass the necessary legislation for the protection of the laboring man, we firmly believe that it is up to that man, through the agency of his union, to inaugurate ways and means whereby he as an individual will be guarded.

To the untutored, a union is only an organization for engineering strikes.

In real fact, that should be and generally is the very last and least of its duties. If every union would study the conditions surrounding its particular field of activity, remedy the defects existing therein, build up the health and welfare of its members, and make them more worthy of their hire, they could easily obtain the intelligent and grateful co-operation of employers. The nation cannot be great in the fullest sense until there is real sympathy between classes. This will not exist until each class understands first itself and its own needs and second the other class and its necessities.

Labor to-day requires a broader comprehension of its own environment. It must study the conservation of health. When it knows what it wants, employers will not be slow to recognize the fact and law-makers will give both classes the laws necessary for the preservation of the health and life of the toiler.

We believe that at least half of the injury and illness to which the workingman falls heir is easily preventable. As the sufferer, he should not wait for the medical profession to take up his burden. His duty is clear. When labor insists on a betterment of conditions, medicine will gladly and vigorously assist.

EUGENICS AND THE CHURCH.

The cause of eugenics has received a great impetus by the action of the Very Rev. Walter T. Sumner, of the Episcopal Cathedral of SS. Peter and Paul, Chicago, and his fellow clergy, in declining to solemnize marriages in which both parties have not received certificates from reputable medical authorities showing them to be in good physical and mental condition. A bill is also before the Kansas legislature requiring medical examination of prospective bridal couples.

While Mr. Sumner is in advance of the times, he is to be commended for an action marked by sanity as well as sanctity.

The ease with which marriage is possible to-day is almost a scandal. Foolish boys and sentimental girls, whose minds are far from mature, marry and later furnish the divorce court with its sordid grist, and scandal-mongering newspapers with a wealth of disgusting details.

A divorce recently granted in Delaware, in which the contracting parties were members of old families, causes one to wish Dean Sumner's rule had been in force when that youthful junior in college eloped with a mere slip of a girl. The shocking disclosures published at the divorce trial conclusively demonstrate the necessity for stricter marriage laws. This instance has only an indirect bearing on the action of the Chicago clergy, but it is assisting in the arousal of public sentiment regarding the necessity of putting up matrimonial bars.

Fifty-three years ago Sir Francis Galton called the attention of the world to the serious side of indiscriminate marriage in his book, "Heredity in Genius." Dividing society into three classes, desirable, passable and undesirable, he found that the majority belong to the second class, the first and third being in the minority. He went on to prove the manner in which the undesirables come into being and how they may be prevented from existing.

Sir Francis thus brought eugenics into being as a separate branch of thought and activity and thinking people at large are to-day stamping his ideas with their marks of approval. But unthinking people continue to persist in committing matrimony and they are the ones who most need to be inculcated with eugenistic knowledge. How seldom do these people inquire into the hereditary tendencies of the man or woman they desire to marry? How often do they ask if there is any history of tuberculosis, insanity or syphilis? Do they realize what effect these conditions will have upon their offspring? Most of them are so overcome by that species of hyper-developed sentimentality called love that such thoughts and inquiries are distinctively repugnant. So they marry and more idiotic, scrofulous, epileptic and defective children are born into the world, to curse their disease-smitten ancestry, if their mental faculties permit them to curse intelligently. If the lovesick young folk are so infected by the bacillus of love that they are for the time non compos mentis, some one should think for them; and here is where the fathers and mothers should act.

In discussing this question, the *Journal of the American Medical Association* in its issue of April 6 quotes a minister as waxing eloquent in the denunciation of what he was pleased to call "health certificate marriage." Said he, "If you would rob the holy marriage rite of its sanctity, if you would divest a sacred custom of its beauty and holiness, if you would make the union of two souls a commercial transaction, then establish a custom which will permit the physician and his science to stand between two hearts that are drawn to each other." At the risk of spoiling this perfervid utterance, we fain would take the liberty of paraphrasing it, thus: If you would rob the holy marriage rite of its present capacity of permitting the infection of your sisters and your daughters with loathsome diseases, if you would divest a sacred custom of its potentiality for perpetuating epilepsy and idiocy, if you would make the union of two souls synonymous with the union of two clean bodies, then establish a custom which will permit science to stand as a faithful guardian of health and happiness over the two hearts that are drawn to each other!

How many men demand to know whether or not prospective sons-in-law have suffered from gonorrhea? No one would knowingly increase the sufferings of mankind, yet the world abounds with blind babies whose poor little lives must ever be spent in eternal night because of the father's early indiscretion.

Statistics prove that three-quarters of the inflammatory diseases of married women are caused by infection by gonorrheal husbands. Thus, is virtuous womanhood and innocent childhood offered up as a sacrifice on the altar of lust.

And it is because some one did not think, or thinking, did not act.

The stockbreeder exercises the greatest care in mating his horses, cattle, sheep and hogs. The government has spent millions in perfecting the knowledge of men along lines of animal breeding, but what effort has been exerted in teaching the people the proper laws governing procreation?

If we are to have a race of Spartans the study of eugenics must be given a prominent position in our educational field, even if it is necessary to sacrifice such useful subjects as the dead and never to be resurrected languages.

Better a race of strong men and women, perfect in health and certain in heredity, unable to tell the difference between a Latin declension and a Greek root, than a world full of physical and mental degenerates, burdened with the unessentials that our modern pedagogical requirements demand.

The physician is the prime teacher of eugenics. He should preach its principles from the house tops. He should promulgate the doctrine of the dangers arising from conjugal union where heredity is tainted. He should portray gonorrheic horrors and impress upon the young men under his care that this oft-believed simple malady is one of the great curses of the race, which should be stamped out at any cost. The physician should ever keep these important facts in mind that he may the better do his full duty as the preserver of health, not only of those under his care, but of the generations as yet unborn.

We therefore hail the action of Dean Sumner as presaging good, inestimable good, to mankind. His action may be ridiculed by some people, but we sincerely believe that as its importance is realized clergymen, as well as physicians and the great thinking laity will commend him and the example he has set will be widely followed.

THE CURSE OF FASHION.

Style, so-called, is one of the baneful influences under which we are living. Women who will follow any absurd custom which has its inception abroad, are ruining their constitutions by compressing their vital organs together so tightly that their figures resemble the old-fashioned hour glass. But style, in the garb of a band of Parisian corsetieres, has decreed that wasp-like waists are au fait and these women must be au fait, even if they do not know the meaning of the phrase. Health and common sense are secondary in these days of feminine sartorial degeneracy. Style also proclaims that women must wear high heeled shoes. Therefore a woman's devotion to style is measured by the height of her heels.

We do not agree with the remark of a New York surgeon, called in to reduce a fractured tibia, resulting from a fall downstairs caused by a high heel. When informed of the occasion of the accident, the surgeon assured his patient he was sorry the fracture was not of her neck instead of her leg.

But it is easy to understand how deeply one's patience can be tried by this nonsensical suppliance before the shrine of fashion. Just now hideous earrings of every color and hue are worn by women as alleged adornments. Many of them impart to the face of the wearer a decidedly equine appearance, but heaven help the unfortunate husband who gives vent to such an expression, for earrings are the style. As many of our women are reverting to savage types, we can shortly expect to see them wearing nose rings and mayhap they will, like certain dwellers in the Pacific Islands, paint their teeth black and find room in the lobes of their ears for an assortment of household utensils. The savages carry a variety of articles and our women would be able to make place for a few hairpins, a tooth brush, powder puff, eyebrow pencil, and other things so dear to some feminine hearts. But the adornment of the person with gew-gaws and the wearing of false hair in the form of wigs, fronts, toupees, switches, curls, puffs

et cetera are not distinctively inimical to health. Most of the frailties de femme merely demonstrate that all the styles are not originated in Paris. Some come from Timbuctoo, Polynesia and the Solomon Islands. For example, notice the pom-pom, a waving plume worn in the hair, like the feathers affected by barbarians. This reversion to savagery is not as harmful as it is pitiful. Many a city woman in her desire to beautify herself in the end becomes ridiculous. Putting behind her the God-given motherly instinct, she contents her soul by prostrating her distorted form before the fashion shrines of Paris, Peking and the Fiji islands and showers her stunted maternal love upon a fuzzy pup. How inspiring it is to walk on one of New York's fashionable thoroughfares and see the number of fashionably attired women, who are carefully guarding a dog at the end of a leash! They watch their little dejectory wants with the same keen interest that most women display in the care of actual children, and we have often felt, in observing the woman and the dog, that it is difficult to discover which face shows the greater intelligence.

A real woman, through whose veins courses the red blood of the hardy people who built up this nation, has higher and more ennobling ideals. Her life does not center around rats and false hair, tight corsets and rouge, high heels and poodle dogs.

It would be a slander upon the sex to say that all women or even a majority, have the atavistic tendencies we have portrayed. But there are in every large city in the country a great many women, of the type we have accurately described, who are a burden to physicians and a conspicuous nuisance to the community. After violating every rule for the proper preservation of health, they expect the physician to keep them in good physical condition, and the example they set before the growing generation of girls is distinctively menacing.

We are not referring to morality in any way. Many of these women who are most pronounced worshippers of the barbaric type are entirely moral and above reproach.

This class is harmful to the people, for if their luxurious habits be carried out in relative ratio, we shall find ourselves back in the days of Lucullus and Petronius.

If physicians will everywhere roundly condemn the modern tendency of alleged fashion to ruin the health of its susceptible feminine followers, the absurd customs may gradually be put aside and finally be left to the denizens of Paris and the islands of the Southern seas.

A NEW CONTRIBUTING EDITOR.

The MEDICAL TIMES is glad to add to its list of Contributing Editors, the name of Otto Juettner, M. D., Ph. D., F. R. S. M., Eng., of Cincinnati, and he will be actively identified with the journal in the future as a contributor. Dr. Juettner is professor of medicine in and secretary of the Cincinnati Polyclinic; permanent secretary of the Western Association for the Preservation of Medical Records; author of Modern Physiotherapy (1906); Daniel Drake and His Followers (Medicine in the Ohio Valley, 1909); Physical Therapeutic Methods (1911); A Handbook of Physio-therapeutic Practise (in preparation). He has also written numerous articles and brochures on medical and medico-historical subjects.

Hexamethylenamin is recommended for breaking up colds. Ten grains dissolved in a glass of water, four times daily, will ordinarily cure a cold. The bowels must be kept open and large amounts of water drunk.

Pediatrics

INFANTILE ECZEMA.

C. A. Simpson, of Washington (*J. A. M. A.*, April 6, 1912), contributes a valuable paper on infantile eczema. He is inclined to favor the staphylococcic infection theory of Fordyce, Bockhert, Sabouraud, Engman and others (staphylococcus epidermatosis) rather than Hebra's theory of local irritation. The rôle of milk of a particular kind he minimizes. If the child is thriving on its diet he makes no changes. If it is undernourished or overnourished he makes the appropriate changes. Bathing of any sort is interdicted. In acute cases steps are taken to dry up the weeping. Resorcin acts well sometimes and aluminum acetate at other times. Fomentations of resorcin may be used in the strength of 10 gm. in one-half liter of water. Two tablespoonfuls of the official solution of aluminum acetate in 250 c.c. of water may be tried if the resorcin fails. If both fail, rice-powder may be used several times daily. When the case reaches the dry stage a 3 to 5 per cent. boric petrolatum is used, or Kaposi's unguentum vaselin plumbicum. This is made by the addition of petrolatum in equal quantity to Unguentum Diachylon-Hebra. The latter is made according to the following prescription:

℞

Plumbi oxidi	90 gm. or ℥iii
Olei olivæ	450 gm. or ℥xv
Olei lavandulæ	8 gm. or ℥ii

Aquæ q. s. to make a rather stiff ointment.

In case of relapse Lassar's paste may be resorted to.

Another good remedy in acute eczema is a zinc paste composed of zinc oxid 6 drams, starch 2 drams, petrolatum album 1½ ounces. This must be applied, about the thickness of a knife blade, two or three times a day and covered with gauze. Every third day it is necessary to remove the ointment with olive oil, in order to decide whether or not the treatment shall be continued. As soon as absolute dryness is established and hyperemia begins to be less pronounced, we may proceed to the more comfortable employment of the lotion introduced by Jadassohn, composed of zinc oxid and starch, each 5 drams; glycerin 3½ drams, distilled water 3 ounces. This fluid should be well shaken and applied to the whole of the affected part by means of a large brush three times a day; it dries in a few minutes and further dressing is unnecessary. Instead of this the lead-water liniment of Boeck is sometimes to be preferred, as pulverized talcum and starch each 5 drams, glycerin 2 drams, lead-water 3 ounces. This is to be used in the same way.

Tar usually acts well when a child is tormented with itching, though it is to be remembered that it is a two-edged sword, and that weeping sometimes recurs under its use. It ought not to be used until the case is absolutely dry and not hyperemic, or at least but slightly so. Less irritating for the purpose is liquor carbonis detergens, in the strength of 2 drams to 3 ounces of rosewater ointment. If this produces no irritation and relieves somewhat we may proceed to use a stronger preparation, such as liquor carbonis detergens 2 drams, zinc oxid 5 drams, glycerin 7 drams, distilled water 3 ounces. Tar in this form is so convenient as to be almost indispensable in eczema of children.

In badly itching cases some form of tar may be combined with phenol, for example, phenol ½ dram, oil of cade 1½ drams, zinc oxid 6 drams, starch 6 drams, petrolatum album 2½ ounces. This almost invariably relieves, but should it become necessary to use pure tar apply the pure oil of cade (painted), afterward placing the child in a lukewarm bath for ten minutes. Then boric acid petrolatum is applied, followed by powder.

Pastes should never be used on the scalp, on account of the difficulty with which the powder is afterward removed from the hair.

Sulphur preparations must be employed where there is a seborrheic element.

Thiol is one of the very best things to use in eczema. It relieves the burning and itching and lessens the hyperemia and swelling. It is antiseptic, desiccating and keratoplastic. It is not at all irritating. The author recommends two forms, as follows: thiol liquid, 7 drams; glycerin, 2 drams; distilled water, 2½ ounces; or, thiol dry, 25 grains; starch, 10 drams. It may also be used as an ointment, for example, thiol liquid, 2½ drams; petrolatum, 5 drams; lanolin, 15 drams.

Internally, arsenic may prove useful in infiltrated, chronic, thickened types. Neuberger's formula is advised, namely, Fowler's solution, 15 drops, and distilled water, 1 dram. For an infant of 6 months, 1 drop is to be taken daily for fourteen days; this is increased each week until the dose of 5 or 6 drops is reached. For older children a correspondingly larger dose is to be employed.

The author has not found vaccines very useful, contrary to what one would suppose, considering the staphylococcic element. They may sometimes clear up the infection due to the organism, but without affecting the skin catarrh itself very much. They are of no avail whatever in acute and subacute vesicular eczemas.

Underlying causes must be sought, such as gastro-intestinal troubles, napkin dermatitis, ear or nasal discharges, scabies and pediculosis.

Nocturnal Enuresis.

John Ruhräh of Baltimore (*Am. Jour. Med. Soc.*, Feb., 1912), in discussing enuresis in children, classes the etiology under six general headings:

Physiological—Drinking too much liquid late in the day.

Eliminative—Taking of drugs and faulty metabolism.

Urinary—Dietary mistakes, hyperacidity and alkalinity.

G. U. Organic—Local irritation, inflammation, adherent prepuce or clitoris, balanitis, vulvitis, calculi and hypertrophy.

Nervous—Irritability, general or of the bladder, sphincteral bladder weakness, malformation of the spinal cord, irritative reflex from rectum, genital organs or intestinal parasites.

General—Diabetes, rachitis, enlarged adenoids and tonsils and insufficient thyroid secretion.

The connection between nocturnal enuresis and adenoids has not been generally recognized, but Ruhräh states that out of 716 cases of adenoids operated on by Fisher, 14.8 per cent. were troubled with enuresis. Mygin reported 7.75 per cent. out of 400 cases and Gruback 14.28 per cent. out of 427 cases. In view of the frequency of enuresis we are hardly ready to accept the theory fully, until more complete data of cures following operative procedure are at hand.

Many physicians will agree that phimosis and enuresis have long been associated. Hamonic circumcised in 187 cases suffering from incontinence of urine with 130 cures. Of these, 47 were cured in 25 days, 83 within 42 days and the remainder were lost sight of. In our experience about 50 per cent. of these cases are relieved by circumcision.

Insufficiency of thyroid secretion is believed by some writers to cause urinary incontinence. Williams has used desiccated thyroids, one-half grain twice a day, in children between the ages of 2 and 6, with good results and Ruhräh is also satisfied with his experience after using this treatment.

In every case the urine must be carefully examined. After all irritative causes have been removed, he suggests restriction of fluids after 5 P. M., careful diet, preventing sleeping on back by tying a knot under the child, waking the child to urinate, use of catheter or sound for reflex irritations, electricity, injection of a solution of salt or silver nitrate, and the use of atropine, strychnia, bromides, ergot or hexamethylenamine. In each case the foot of the bed should be raised, the child be given a selected diet and compelled to avoid everything of an exciting nature.

Ruhräh recommends 20 drops of fluid extract of ergot, t. i. d. for a child 5 years old, as a bladder tonic and for irritability at the neck of the bladder he gives 1/400 to 1/300 grain of atropin an hour or two before retiring.

Cerebral Rheumatism and Salicylic Acid.

Drs. Nobecourt and Darré (*Bull. Soc. de Pediat.*, No. 8, 1911) report the case of a 7 year old boy taken ill with acute articular rheumatism, the mitral and aortic valves being affected. Upon the fifth day the boy had delirium, hallucinations and profound mental depression. Lumbar puncture was done six times and twice salicylic acid reaction was present. The drug had been administered in small doses from the inception of the illness. The drug was immediately stopped, but the mental torpor persisted for a considerable period. For this reason the authors feel that cerebral rheumatism, rather than salicylic intoxication, was the cause of the prolonged mental disturbance. In discussing the paper Dr. Guinon said that he had observed the administration of salicylate of sodium to children followed by symptoms resembling diabetic coma and acetonemia, but in two cases he had seen delirium and hallucinations.

TEMPERATURE ELEVATION IN HYPERTHYROIDISM.

The Graves-Basedow symptom complexes are ulterior manifestations of hyperthyroidism, but the toxic state known as hyperthyroidism may exist in the absence of thyroid enlargement, exophthalmos, tremor, and persistent tachycardia. Hyperthyrotoxicosis may be established even when there is no suggestion of the presence of a rudimentary or incomplete form of Graves-Basedow's disease; in short, increased thyroid activity need not manifest itself by the usual train of symptoms which we commonly associate with so-called Basedowoid conditions. The old symptom complexes arise on the basis of hyperthyroidism, and exophthalmic goiter is readily diagnosed; the lesser expressions of hyperthyroidism are commonly misinterpreted and not linked to each other. Early and mild cases of hyperthyroidism are, therefore, frequently unrecognized, says Heinrich Stern (*Arch. Diagnosis*, No. III, 1911).

There is no doubt that many cases which are designated as neurasthenia or hysteria, are expressions of acute or chronic thyrotoxicoses. This misinterpretation is even excusable in some instances. Neurasthenia may be etiologically associated with Basedow's disease, and it is often a perplexing task to differentiate between neurasthenia and certain incomplete forms of Basedow's disease. Furthermore, a minor case of hysteria and an early or mild thyrotoxic state have many symptoms in common. Some of the rarer hysterical phenomena, as hysterical fever, or hysterical tremor together with accelerated cardiac activity, clinically viewed, appear to be the immediate result of hyperthyroidism.

Elevation of temperature is one of the early, if not the earliest objective symptom of many instances of hyperthyroidism. It seems to be a much more constant manifestation in the mild than in the more pronounced instances of the affection. In many cases the mouth temperature is raised but one degree Fahrenheit, or a fraction thereof; in others the increase amounts to two or even three degrees Fahrenheit. In some cases the temperature fluctuates, with occasional intermissions, between the narrow limits of 99 and 99.4 deg. F., for months and even years; in others, the slightest exertion or excitement drives it up from 99 to 100 deg. F., or thereabouts. In a majority of instances the lowest temperature is recorded after a night's rest; continued rest in bed will occasionally reduce the temperature to normal for a brief period. The usual discrepancy of about half a degree Fahrenheit between the mouth and rectal temperatures does not exist in all cases; in some cases the discrepancy is less than 0.3 degree, and in a few there does not seem to prevail any discrepancy at all.

While exophthalmic goiter occurs about ten times oftener in women than in men, it is still an open question whether the lesser degrees of hyperthyroidism arise in both sexes in a similar proportion. Stern has seen three or four times as many of the lesser cases in women as in men. It is, however, possible that some clinical evidences of lesser degrees of hyperthyroidism may differ in both sexes, and that in men the specific toxicosis is more frequently overlooked or taken for something else.

Most of Stern's cases of mild hyperthyroidism occurred between the twenty-eighth and forty-eighth years of life, and in women at least, there seemed to be a direct connection between thyroid hyperactivity and the functional decline of the sexual glands. Thyrotoxic temperature elevation never reaches the extreme height of hysterical fever, but it is enduring for a longer period. While there generally ensues a rapid decline of hysterical pyrexia, the slight thyrotoxic temperature increase abates slowly, as a rule. Like the fever of hysteria, however, that of hyperthyroidism may start abruptly, and like the former it is liable to appear, or to become augmented, in the wake of any exertion or excitement.

Hysterical pyrexia may be differentiated from thyrotoxic temperature elevation by these factors, viz.: hysterical fever does not, as a rule, concur with physical decline and emaciation, thyrotoxic temperature elevation usually does; the urine in instances of hysterical fever exhibits a small urea and phosphoric and quotient, whereas in the presence of hyperthyroidism it is increased; hysterical pyrexia is usually not influenced by the administration of preparations of thyroid or iodin, while these drugs are liable to prolong or aggravate the thyrotoxic fever.

Each factor may be readily ascertained; the first, by the recent history of the patient and, if possible, a short observation period; the second, by a few simple laboratory tests that should cover a period of not less than one week, and the third, by the ingestion of medium doses of dried thyroid (0.15 gram three times a day), or of potassium iodid (gtt, x to xx of a 50 per cent. solution three times a day) for from two to four days.

Iodin should not be administered as it is likely to aggravate the condition of many of these patients. This is probably due to the increased general metabolism in the febrile state which may also induce thyroid hyperactivity. In many instances of acute disease we thus have, in addition to the latter and on account of the accelerated metabolic processes, what practically amounts to a transitory hyperthyrotoxicosis.

When hyperthyroidism is not merely an incident but the sole and enduring anomaly, the iodin influence should, logically, be more noticeable. Not only the thyrotoxic fever may be rekindled, should it have temporarily abated, but also some other thyrotoxic phenomena are likely to make their appearance. Thus we may suddenly be confronted with unexplainable restlessness and excitability, or languor and apathy, and with unusual cardiac manifestations. The ensuing iodin syndrome, the one on the basis of hyperthyroidism and not that which is clinically known as iodism, is analogous to the toxic state arising from thyroid overfeeding in the healthy individual.

Stern gives this clinical observation:

Mrs. E. S., mother of one child. She had not been ill since childhood, menstruated regularly and lived in affluent circumstances. In the latter part of 1909, when 45 years old, after a very active life, experienced unwonted lassitude. The slightest exertion brought on profound exhaustion, mental depression and cardiac palpitation. There nearly always was a slight temperature elevation which would become still further augmented upon walking. Her physician promptly interpreted the condition as being due to the approaching climacteric and to myocardial disease. He advised a prolonged stay at some European health resorts, and especially a course of treatment at Nauheim. She returned in the autumn of 1910 unimproved, having lost about twenty pounds. Menstruation was regular. She exhibited a very low degree of resistance; changing position from recumbent to sitting posture while in bed would force the pulse from 98 to 108, and higher. The blood pressure varied between 90 and 110 mm.Hg. The temperature was occasionally normal after a night's rest; most of the time it was slightly above 99 deg. F. in the morning; four or five hours afterward it reached the 100 mark. Occasionally the temperature would climb to 101 and even to 101.5 deg. F. The higher degrees would especially obtain after excitement. A profound depression overcame her, and she believed she would never be well again Withal there was no structural anomaly detectable anywhere. There was no gross change of the thyroid gland and no exophthalmos; palpitation and tremor, on the other hand were present. The latter phenomena, and the fact that she had lost weight, prompted Stern to undertake a few metabolic experiments which evinced nitrogen waste and augmented phosphoric acid excretion. The administration, for purposes of diagnosis, of a tablet composed of thyroid and its modifiers, adrenals and sodium cacodylate, aggravated the physical and nervous state of the patient; the temperature remained around 101 deg. F. for nearly three days; there ensued a piercing right-sided headache, dyspnea, a dry cough and diarrhea. Discontinuance of thyroid ingestion was followed by abatement of the provoked phenomena after about two days.

There was no reasonable doubt that the patient's condition was the outcome of a thyrotoxic process. She was subsequently treated for hyperthyroidism with fairly good results. Palpitation, tremor, irritability and prostration disappeared; the body-weight increased; the nitrogen equilibrium was re-established, but a slight, more or less intermittent, temperature elevation persists. The patient's catamenial status remains unchanged.

The induced thyrotoxic phenomena do not invariably abate when thyroid or iodin administration has been discontinued. They may persevere. Thus, thyroid and iodin may not only activate a dormant hyperthyroidism, but their brief administration may be followed by an enduring thyrotoxicosis.

In instances of suspected hyperthyroidism great care must therefore be exercised when administering thyroid or iodin for diagnostic purposes. The drugs should be given in medium, but active, amounts, and be immediately discontinued on the appearance of thyrotoxic symptoms. It seems, on the other hand, that thyroid or iodin will not so readily cause lasting harm in instances of frank hyperthyroidism. There was a time—and it is not so long ago—when we believed that preparations of thyroid were indicated in the treatment of exophthalmic goiter! In outspoken cases of hyperthyroidism, thyroid or iodin are, of course, not needed for diagnostic purposes.

In hyperthyroidism there prevails augmented perspiration and body-heat. There is also this latent tendency to temperature elevation. The three symptoms are undoubtedly the result of one and the same cause; either the direct thyroid oversecretion, or the increased irritability of the sympatheticus. But while the subjective feeling of heat continues uninterruptedly for a more or less protracted period and the determinable increase of body temperature, with occasional intermissions, for practically the same length of time, the attacks of profuse perspiration supervene after longer or shorter intervals. There is no doubt that in a number of cases the heat-regulating apparatus of the organism is still able to control temperature elevation to a certain extent.

It may be normal to have a slight systolic fall on standing after lying in healthy individuals who are not undergoing active muscular training. Patients with relaxed abdominal musculature and enteroptosis, not showing subjective symptoms, will be found to have at least the diastolic sustained in change of position and it may be assumed that the vasomotor mechanism is competent.

Patients with relaxed abdominal musculature and enteroptosis with circulatory symptoms will show both a systolic and a diastolic fall on standing after lying. The neuropathic symptoms found in these cases are not due to the malposition of the viscera but are entirely dependent on the cerebral anemia. The circulatory changes are not the primary etiologic factors, but are second to the great muscular atony, the cause of which is yet unknown.

The Medical Editorial Table

In appending what some of the medical editors are thinking and saying, we interpolate occasional thoughts and words of our own thereon.

Polar Exploration and Medical Research.

Medically, the interest of polar exploration lies chiefly in the knowledge which it may afford of the physiology and powers of resistance and endurance of the human organism under extreme climatic conditions. The problem of success consists essentially in protection against cold and exposure and in the maintenance of an adequate food supply. It has been recognized for some time that intense cold of itself is not productive of disease. The unanimous testimony of Arctic explorers has been that as long as they were among the ice fields they were free from influenza, tonsillitis, bronchitis and pneumonia, diseases which, however, many of them contracted on their return to the infective environment of warmer climates. They might perish of hunger or exhaustion, but not of inflammatory processes. With adequate clothing and opportunity for shelter, a human being can, apparently, withstand an intense degree of cold for a considerable time. It is reported that Amundsen's men were quite comfortable in calm weather at 68° below zero Fahrenheit, though they found traveling impossible during a gale at that temperature.

Should it turn out that two explorers, working independently, have discovered the South Pole, we shall be reminded of numerous other scientific achievements similarly distinguished. The demonstration of surgical anesthesia stands as the chief instance of simultaneous discovery on the part of two investigators. We will amend this statement and say "nearly simultaneous," for we have no wish to offend the partisans who are still engaged in a settlement of the question. It is, however, a remarkable fact that whenever human interest becomes sufficiently focussed on any unknown thing, its discovery is often synchronously accomplished by separate workers from different points of approach. Very likely the same may prove true in the case of cancer, at the present the most important problem in the field of medicine. After all, the most important discoveries and battles are those of science and civilization, and great though the romance and heroism of polar exploration may be, the greatest are those of medical research and conflict.—(*Boston Medical and Surgical Journal*, March 14.)

The Harvard Graduate School of Medicine.

For many years it has been apparent to the observing that the demand for post-graduate instruction has so far increased as to force upon medical schools some definite provision for this type of work. The reason for this is not difficult to see. With the enormously expanding scope of medicine, the development of specialism, and the increasingly wide field which the medical student is called upon to cover before the attainment of his degree, it is a natural and inevitable consequence that men of ambition feel themselves scantily equipped for medical practice and not equipped at all for work in special departments of medical research. Harvard, in common with other schools, has heretofore attempted to meet the problem through so-called graduate and summer schools which were really adjuncts of the undergraduate departments. While graduates in medicine were given the privilege and opportunity of refreshing or advancing their knowledge on subjects in which they experienced a particular lack or found a particular interest, these privileges and opportunities were not so good and great as more systematic organization of such schools would insure. Hereafter, at Harvard, the undergraduate and post-graduate teaching will be clearly separated and developed. This is a unique step, but there can be no doubt that it will meet the manifest exacting demand of the future. The dean of the new school is Dr. Horace D. Arnold. The school will have its separate administrative board. We are inclined to think that such a school will overshadow the undergraduate school ultimately, but we see no evil in that event. There were four hundred and fifty-one graduate students at Harvard during the year which ended October 1, 1911, which gives us some idea as to the future magnitude of this department.—(*Boston Medical and Surgical Journal*, March 21.)

The Question of the Day.

We are threatened to-day by the Department of Education of the State. Seriously threatened. A double standard of education would be an odious and unfair thing. It was bad enough when the legislature recognized osteopathy as a school of medicine, a school which recognized but one alleged fact in pathology—the displacement of a vertebra—one remedy, its manual replacement. It was bad enough when the Vice-Chancellor of the Board of Regents who should be the guardian of higher education was not true to the ideals of his office. It is still worse when he joins the ranks of the anti-vivisectionists. The *Brooklyn Eagle* is to-day the only newspaper which champions their cause, and the Vice-Chancellor of the Board of Regents is its editor. It is well that the physicians of the State know who are their friends and against whom they must contend in battle array. We never expected to find in the State Board of Education an active enemy or in the State Board of Regents, in the person of the Vice-Chancellor, an active partisan of an offensive and retrograde movement which, if successful, would put back the cause of research and tie the hands of investigation and which is to-day trying to cast unwarranted suspicion on an honorable profession. These problems involve, if not our very existence, certainly our prosperity and well being. We have fallen on evil times and into evil ways, and there are traitors among those who ought to help rather than harm us.

As the MEDICAL TIMES understands the situation, the head of the Department of Education recently expressed himself as believing that different classes of practitioners should be subjected to different educational tests, certainly a pernicious doctrine. Will the medical profession ever wake up to the dangers which threaten it and learn to use its tremendous latent powers of resistance and defence?—(*New York State Journal of Medicine*, March.)

The Decrease of Fertility.

Herbert Spencer thought that fertility diminished with civilization as a necessity of evolution. Darwin appears to have believed similarly. Doubleday assigned overfeeding as a cause of decreased fertility and claimed that underfeeding stimulated fertility. At any rate there exists a tendency in every civilized nation to restrict reproduction of the species. Some causes incidental to civilization are obvious; for example, postponement of marriage or avoidance of marriage. Yet such causes do not fully explain the steady decrease of the birth rate which has taken place in France and which is now taking place in England and among some classes in this country. Newsholme expresses the view that the main cause of the modern very small family is that the parents, and especially one of the parents, do not wish for many children, and accordingly the limitation of the family is largely volitional. Undoubtedly the fact that a large proportion of the population live in cities is responsible to a considerable extent for small families. In New York and in other American cities there is a distinct relationship between small families and apartments. Apartments and large families for many patent reasons are not compatible. But it is not in this country and in France and England alone that the prevention of large or even fair sized families is common; it prevails in all civilized lands.

We should go slow with the eugenic program, for there are many standpoints from which to consider this large subject. One thing is certain, that there is need for encouraging the propagation of the fit and discouraging the multiplication of the unfit.—(*Medical Record*, March 16.)

A New Theory of Nephritis.

In spite of much experimental work and clinical observation the pathological physiology of nephritis has not yet been cleared up. A new theory has recently been put forth by Martin H. Fischer, of Cincinnati, as to its real etiology. Fischer's work is founded upon the study of colloids and their behavior under different experimental conditions, comparable to those under which the kidneys perform their work in health and in disease. The colloids involved in nephritis, according to Fischer, consist in the main of the blood, which is essentially a suspension of colloids in which are floating fairly solid jelly-like structures or cells; of the "urinary membrane," which includes all the structures that lie in the kidney between the blood on one side and the urine on the other, and of the urine, which normally is a solution of salts and is not colloid in nature but whose colloid content rises in nephritis. Albuminuria, that chief urinary change in nephritis, has always been held to be due to the escape of the albumin of the blood through the diseased kidney, or what Fischer terms "the urinary membrane." To Fischer, however, albuminuria is something quite independent of the blood; its albumin is derived not from that tissue but from the kidney itself, whenever circumstances arise that favor the transition of the gelatinous colloids of that organ to the soluble state in which albumin is found in the urine. These circumstances may arise in different ways, but their chief mark is the fact that they produce an increased amount of acid in the kidney and thus favor the solution of its colloids. This production of acid is to Fischer the alpha and omega of nephritis, the cause of albuminuria, the cause of the morphological changes in the kidney, the cause of the production of casts, of the variations in the amount of urine, and of the dissolved substances secreted by the kidney. While the normal kidney is not acid in reaction, a kidney of nephritis, as shown by microchemical methods, becomes acid, and takes up corresponding dyes. Sections of freshly excised kidney take up such stains but very slowly, and very slowly give up albumin to the solution in which they are immersed. But let a trace of acid be added and all parts of the kidney become deeply stained, and the albumin content of the surrounding fluid is quickly increased.

The morphological changes in the nephritic kidney are likewise explained by the accumulation of acid; it leads to the absorption of water by the individual cells, to the "edema" of them, and a consequent increase in the size of the kidney; it produces changes in its colloids and consequent "cloudy swelling" of the cells; it leads to the filling of the uriniferous tubules by the dissolved colloids and the consequent appearance of casts in the urine. Only subsequently the damaged tissues are replaced by connective tissue which slowly takes up the space of the parenchymatous cells, slowly contracts and leads to the appearance of the later stage of the nephritic kidney, namely, the small or atrophied organ.

Experiments and clinical observations apparently bear out Fischer's theory and make it seem sound. Certainly it is plausible. The practical point about treatment of the edema is intravenous or rectal administration of concentrated solutions of alkalies and salt. This seems a radical departure from our well-established practice of withholding salt in nephritic edema. But nephritis is too important a chapter in human pathology to excuse any disinclination to test out any new and reasonable theory of its etiology.—(*Medical Record*, March 23.)

The Adrenal Cortex in Relation to Sexual Characteristics.

While the medulla of the adrenal is concerned with the production of epinephrin, the cortex is in some way functionally related to sexual development. The adrenal cortex is essentially of the same origin as the ovary and testicle, while the medulla is part of the so-called "chromaffin system," which develops in connection with the sympathetic and is of neuro-ectodermal origin. Hence the cortex and medulla differ in function. Evidence of this functional relation of the cortex is seen in the small size of the part in defective development of the sexual organs; in its enlargement after castration, in the increase that occurs during pregnancy and after menstruation; and especially in the hyperplasia observed in the forms of pseudohermaphroditism, in which the internal organs are female and the external male; but most of all in the peculiar changes in sexual characteristics that develop in connection with certain tumors of the adrenal cortex. The tumor in question is referred to usually as adrenal hypernephroma, and its structure reproduces largely that of the adrenal cortex; it is generally unilateral, often associated with metastasis, and seems to occur most frequently in female children. In children this tumor almost invariably is associated with a precocious growth of the body and of the sexual organs with overgrowth of hair and fat. There is a tendency to an increase of the male characteristics as shown by the occurrence of beard, absence of menstruation and hypertrophy of the clitoris. Usually there is increased pigment in the skin and mental dulness. It seems that in adult females also the development of the tumor may be associated with the appearance of male characteristics, but when it occurrs in women after the menopause and in adult men there are no sexual changes. There is a case recorded in which the hair fell off after the tumor was removed.—(*J. A. M. A.*, April 6.)

The Death Dealing Influence of High Cost of Food Supplies.

Doubtless the most lamentable feature of the steadily increasing cost of food supplies is one which so far has received but little if any attention, viz., its influence upon the resisting power to disease of those who are obliged to adjust their diet list to their limited earnings. Even where there have been advances in wages they have failed to keep pace with the advancing cost of the necessaries of life. The brunt of the deficiency must naturally fall upon the vast majority of the population—that which already, in point of sanitary surroundings, is most exposed to all the evil conditions which render the body an easy prey to infection. It is mainly of substances rich in albumins, such as meat, eggs and other animal foods, that our immunizing mechanism is built, the carbohydrates determining muscular activity. Deficiency of food predisposes the body to infection. Epidemics follow famines. Underfeeding is the biggest of tuberculosis factors. There is no want of experimentally demonstrated facts (such as Metchnikoff's proof of the lack of immunizing substances in the food of underfed individuals) to attest the absolute dependence of the bodily resistance to disease upon the intake, not only of sufficient food, but also of those foods which best supply the blood with antibodies. Therefore this question of the increased cost of living involves the very existence of a multitude of human beings, since it has to do mainly with those articles of diet which constitute the fabric of immunity—foods rich in albumins. The industrial slave, the overburdened and the weak are driven to reduce their intake of defensive values and thus to enhance the death-dealing influence of the scourges to which they are exposed. A recent investigation disclosed the fact that the death rate among the children of the very poor is about seven times greater than among the children of the rich.—(*New York Medical Journal*, March 23.)

The enteroptotic habit of adult life is seen in its fundamental characteristics in the frail child—frailness, lack of fat, slenderness of muscle and lack of vigor in bodily development. The actual collapse of the thorax and the lessened capacity of the upper abdomen are observable only in older children, and then only exceptionally, but the muscular insufficiencies of later life are common in frail children. The prolapse of the kidneys, stomach, colon and the intestines, which is seen in the adult, is not pronounced in children under 12 except in rare instances and then only as a late development.

Hospitals and Sanitaria

THE SANITARIUM HOSPITAL.*

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The hospital originated in the exigencies of warfare. The wounded soldiers in the besieged city were gathered into the churches as the most available and commodious places in which to care for them. In some of the older European cities one may find hospitals which were originally churches and still wear the general aspects of a church—windows far above the floor, a big stained glass reredos, even pulpit and crucifix. Every hospital still preserves the evidence of this emergency beginning, in the great ward rooms and the long rows of beds, uniformed attendants, and general military appearance.

Of the three great professions, medicine seems to be by far the most conservative; and it has only been in comparatively recent times that the fetters of precedent and ancient sanction have been loosened sufficiently to permit any material departure in hospital construction and management, from the methods which originated in the emergencies of war a thousand years ago.

That such departures are necessary has long been recognized in the provision by all modern hospitals for private patients in separate rooms and special rooms for critical cases. But even this modification of the cathedral-like ward system is very modern, and there are to-day but few great hospitals which furnish more than a very limited number of rooms, in which the privacy, quiet and special attention now recognized as being desirable and even essential for the highest welfare of the patient, may be secured.

The marvelous development in physical or physiological therapeutics within the last century has so enriched our therapeutic armamentarium that the facilities and methods of the old-time hospital have proven altogether inadequate. The result was at first the development of a variety of institutions, each representing some single new therapeutic agent which was in their enthusiasm regarded by its votaries as a panacea for human ills and so exploited to the neglect of other measures equally valuable. This was the origin of water cures, which were so numerous both in this country and Europe about the middle of the last century, and the numerous electrical institutes, movement cures, diet cures and like establishments. The inadequacy of the hospital to meet the demands of scientific progress may, perhaps, be to no small degree responsible for the empirical exploitation of so-called natural or physical remedies in the early history of these therapeutic measures; and, perhaps, also, for such pseudo-medical practices as osteopathy and chiropractic, and even Christian Science and magnetic healing.

As a student of the late Dr. Austin Flint, one of the most progressive medical men of his time, the writer became deeply interested in physiologic methods, and thirty-five years ago embraced an opportunity which offered, to make an attempt to bring together under one roof in an organized form all the resources of modern scientific medicine. The beginning was very small—two or three two-story wooden cottages and a dozen patients. I was encouraged in the attempt by a paper by Dr. S. Weir Mitchell, read about that time before the American Medical Association, in which he emphasized the need of institutions where patients could have the advantages of rest, scientific feeding, massage, applications of electricity, baths, and other like measures. These therapeutic means were at that time not available in any hospital in the United States, nor in any institution under scientific management. The idea was to add to the advantages of the ordinary hospital all the recently developed resources of physiological medicine, and to make provision for the practical application of the discoveries of Voit, Pettenkofer and others in metabolism and scientific nutrition.

One of the early problems was the selection of a suitable name. The word "sanitarium" was coined to meet the case, by modifying the word "sanatorium," which was then defined by Webster's dictionary as "in England a health resort for invalid soldiers." So far as the writer knows, this was the first use of the word "sanitarium." The present usage of the word applies it to any establishment which affords hotel or boarding-house accommodations in connection with baths or any other curative means. Hence the title of this paper, "The Sanitarium Hospital," a term which indicates more clearly than does the word Sanitarium as now understood, the writer's conception of what an up-to-date institution for the treatment of the sick ought to comprise.

Although the ultra-conservatism of the medical profession has greatly delayed the recognition of the newer therapeutic measures of a physical sort by the great mass of practitioners, the time has certainly come when no great medical institution can fill the prescriptions of up-to-date scientific medical men without an equipment which includes all the great healing agencies embraced under the general term, "physiotherapy."

Nearly every insane asylum in the United States has within the last ten years installed a hydriatic department, and is making more use of water as a means of relieving insomnia, improving metabolism and combating the physical causes of mental disease than of all drugs put together. A few years ago I heard Dr. Edwards, then superintendent of the State Hospital for the Insane at Kalamazoo, Mich., in a discussion of a paper on hydrotherapy read before the Kalamazoo Academy of Medicine, make, in substance, the following statement: "Although we have twice as many patients at the present time as we had twenty years ago, a recent examination of our books shows that we use less sleep-producing drugs in a whole year than we formerly used in a single week. When our patients do not sleep or are disturbed, a bath of some kind or a wet cloth applied somewhere, quiets them and sends them off to sleep." The medical treatment of the insane has been completely revolutionized in this country, as previously in France and other European countries, by the introduction of hydrotherapy and other physical measures.

But what hydrotherapy is doing for the insane, for neurasthenics, dyspeptics and valetudinarians, physiotherapy is capable of doing for all curable human maladies. No intelligent therapeutist now regards the outdoor treatment as a remedy specifically restricted to use in pulmonary tuberculosis, in the same sense in which quinine is related to malarial infection. A New York hospital that has an open-air ward on the roof, has not only saved the lives of scores of babies sick unto death, but has demonstrated to the whole country and to the whole world the value of the open-air method in pneumonia. The Johns Hopkins Hospital has furnished an equally striking demonstration of the value of outdoor exposure in surgical cases. It is safe to say that all great hospitals erected in the future will make ample provision for the exposure of patients to the sun and fresh air, and will provide an adequate equipment for the efficient application of scientific hydrotherapeutics.

When it is known that the first shower bath ever used was made and employed in an Edinburgh hospital, it is surprising, indeed, that the shower and the douche in its various forms, with other hydriatic measures, should have been so long left to be the monopoy of empirics and enthusiasts, and should only now, after more than a century of neglect, be just beginning to find the recognition which rightfully belongs to them.

The resources of physiotherapy are numerous and varied. The marvelous vitalizing powers of light, so well known to the ancients and recalled to the attention of the medical profession in recent times by the classical experiments of Finsen, are

* Paper read at the Annual Meeting of the American Hospital Association, 1911.

needed in every hospital. The hospital equipment should include cabinets, both fixed and portable, photophores, arc light, and other facilities for the application of radiant energy in the form of actinic and luminous heat waves. By these means, the sunlight stored up in coal fields may, through the agency of the electric dynamo, be resuscitated and brought to do service in sick rooms from which sunshine is excluded by clouds or opaque walls.

Electricity, though far more limited in its application, is capable of rendering inestimable service, and must be represented by an efficient equipment in the sanitarium hospital of to-day. The galvanic and sinusoidal currents render especial service by stimulating metabolism and administering passive exercises to bedridden patients, and otherwise.

It is needless to mention the value of the X-ray, a development from electricity, both in diagnosis and therapeutics, for this is universally recognized.

Medical gymnastics, especially the Swedish system, massage and mechanotherapy, are powerful therapeutic means which are capable of contributing greatly to the advancement toward recovery of the convalescent surgical or fever case, as well as the victim of chronic disease. I fear we do not always appreciate the injury which the average hospital patient suffers from confinement in bed. Massage, medical gymnastics and mechanotherapy, especially in connection with the sinusoidal electrical current, afford perfect means of counteracting this deteriorating influence, which often defeats the efforts of the most expert surgeon.

But, perhaps, the most important feature of the sanitarium hospital is the dietetic department. There is no way in which a hospital patient can receive greater help toward recovery than by right feeding. A special study of the Sanitarium Hospital must be, to give to its patrons the benefit of the very latest discoveries in metabolism as related to nutrition and the very highest expression of the culinary art directed and applied with scientific acumen and trained experience. The diet kitchen already has a recognized place in every hospital. But why should a hospital have any other sort of a kitchen than one which is scientifically administered? No curable patient ever enters a hospital who may not be benefited by scientific regulation of his diet.

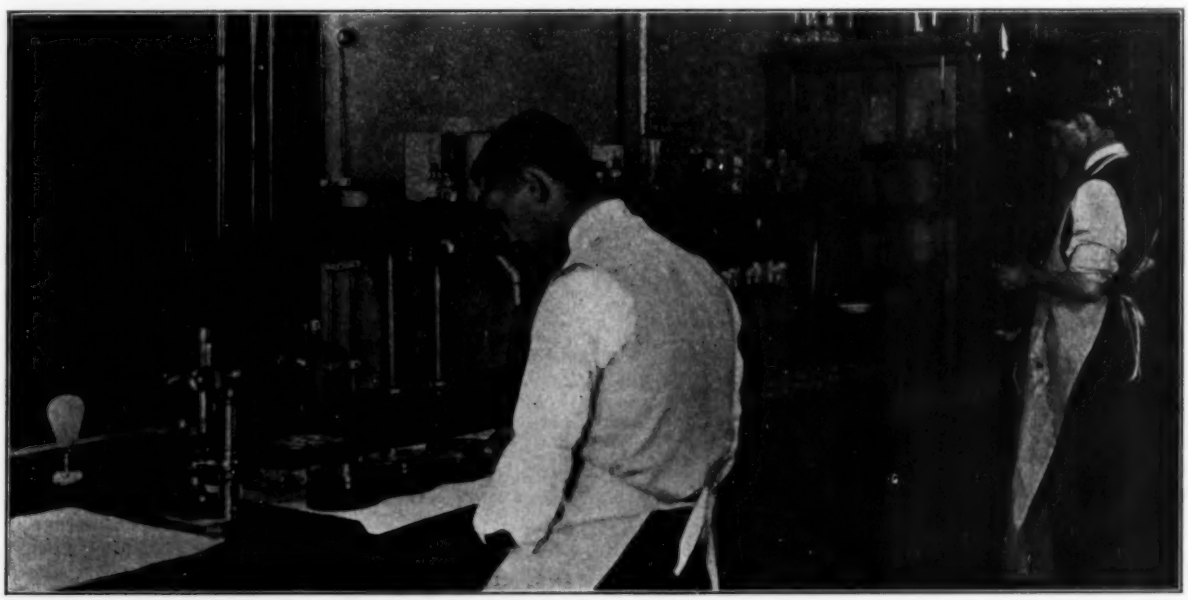
Is there not great room for progress in matters dietetic in the average hospital? Certainly the Sanitarium Hospital, which

THE URINARY LABORATORY.

should represent the modern medical institution in its highest expression, must give paramount attention to dietetics. This requires a corps of trained people—trained dietitians, trained cooks, nurses and doctors trained in the physiology of digestion as revealed in the most recent researches and acquainted with the results of the latest studies in metabolism. The preparation of foods must be conducted with the same intelligent and scrupulous care as the compounding of drugs. Foods may be served with such accuracy that the calorific value of every serving may be known. A physician knowing thus the actual worth of each article served to his patient, in proteins, fats and carbohydrates measured in calories, may make his prescriptions of diet with the same precision with which he prescribes a laxative or a heart stimulant.

One by one, the great resources of physiotherapy have been rescued from empiricism and charlatanism and placed under scientific control, and the time has certainly come when the feeding of the sick should be taken wholly out of the hands of the ignorant and untrained, delivered from the rule of thumb and fancy, and elevated to its proper place among the agencies for the promotion of recovery.

The Sanitarium Hospital must of necessity maintain a thoroughly equipped clinical laboratory. The therapeutic instruments of such an institution cannot be intelligently applied without the aid of such accurate knowledge as only a modern clinical laboratory can give. Every prescription must be made with a view to the removal of the causes of the pathological



LABORATORY FOR EXAMINATION OF THE INTESTINAL CONTENTS

CORNER OF THE GASTRIC LABORATORY.

condition present or the regulation of some physiologic process by which the remedial forces of the body are seeking to effect a cure.

But the Sanitarium Hospital, no matter how perfectly constructed, ventilated, heated, lighted and equipped, needs, most of all, one thing—intelligent direction, guided by a broad knowledge of the resources of modern scientific medicine and a versatility and aptitude in the application of these resources. It is very easy to fall into ruts and to continually play upon one therapeutic string. The Sanitarium Hospital should be a place where properly trained physicians will undertake to give their patients the benefit of all the curative resources known to man which can be made available in one place. Organized team work is necessary, so that the patient may have the benefit of what might be termed a full orchestra of therapeutic agents. In too many hospitals there are hydriatic, electrical and other equipments for physiotherapy which are rusting in disuse. The profession are, however, beginning to recognize that the physiological era in medicine has arrived, and there can be no question that in hospital and private practice, but especially in hospital practice, physiological and so-called sanitarium methods will in the future play a far greater part than in the past.

Not the least important function of the Sanitarium Hospital is the education of its patrons in correct habits of life. Most chronic diseases are the result of errors in personal habits in relation to diet and other matters of individual conduct. The mortality from chronic diseases is rapidly increasing; has doubled, in fact, within the last thirty years, a fact which affords indisputable evidence of the necessity for a campaign in behalf of right living. If out-of-door air is valuable as a therapeutic measure, it is equally valuable as a means of prophylaxis. If baths and other means re-enforce vital resistance and so aid the sick man in his battle for recovery, these measures are capable of rendering even greater service in fortifying the body against disease. The people are dying for lack of knowledge, and the unusually favorable opportunity afforded by a few weeks' sojourn under daily medical supervision ought not to be allowed to pass unimproved. A stay in a hospital ought, in fact, to be a period of health training of both mind and body, so that when the patient has reached recovery and the time for his departure, he will be fortified with knowledge of ways and means by which he may avoid sickness in future and so make his life better worth living through increased health, happiness and efficiency.

This paper has not undertaken to make a complete description of what the Sanitarium Hospital ought to be, but only to present a general outline of the writer's concept of what a complete and highly organized medical establishment should include.

HOME HOSPITALS FOR TUBERCULOSIS.

An experiment to demonstrate the feasibility of a plan to wipe out the centres of tuberculosis infection in the tenement districts of New York and other cities has been undertaken by the New York Association for Improving the Condition of the Poor. An entire section of the East River Homes has been leased for three years and has been converted into a home hospital. In this new institution the association has begun a new experiment in the home treatment of consumptives and the relief of persons suffering from the disease. Into each of the twenty-four apartments will be moved a family dependent upon the association. For the next three years an effort will be made to determine whether the spread of tuberculosis can be checked and cures effected under medical direction, aided by competent nursing, adequate relief, freedom from worry, fresh air and sunshine, and room for reasonable segregation.

This experiment is prompted by the increasing number of families that are reduced to dependency by tuberculosis, and by the length of time that it is agreed will be necessary to provide hospital and sanatorium care for all who are in need of treatment. Out of the 3,500 families now under the care of the association, there are 284 in which there are one or more cases of tuberculosis. Acording to the statistics of the health department, 10,074 died in New York in 1910 of tuberculosis. There were in the same year 32,065 new cases reported, and it is conservatively estimated that there were 50,000 living cases in the city a year ago. Despite the aggressive and successful campaign now under way for the adequate care of tuberculous patients, it is admitted by experts that several years will elapse before ample hospital and sanatorium care can be provided.

In this new home hospital the association will provide for segregation within each apartment and for fresh air treatment. A hospital and sanatorium regime will be instituted and everything affecting the health both of the patient and the other members of the family will be carefully supervised. Equal attention will be paid to the social and medical side of the families.

Patients will be allowed to work only on the advice of the physician, and when permitted they will begin gradually as their strength permits. In order that cures may be permanent, families will not be dismissed from the hospital until the patients have practically recovered full strength and until they are able to work full time. After dismissal each family will be moved into a suitable home and supervision will be continued by the association until it is assured that the cure is permanent and the family actually self-supporting.

The tuberculosis children and those predisposed to the disease will attend an open air school, which will be established on the roof of the East River Homes. The children of school age who are in good health will attend the public school, and others whose health will permit will work.

This experiment, which experts consider to be of national importance, will be conducted under a special committee of the association, consisting of Dr. Linsly R. Williams, chairman; Cornelius N. Bliss, Harry Pelham Robbins and Dr. Livingstone Farrand. Miss Helen Knight Smith, the supervising nurse, will devote her whole time to the direction of the experiment. There will be a visiting housewife, who will assist the housewives with their heavier work, the association's dietitian will give individual and group instruction in food economics and food values, and visitors and other persons will co-operate on the social side of the experiment.

Intractable vomiting with pain, either abdominal or localized in the groin, especially in women, should indicate careful examination of the femoral rings, even before it is obvious that intestinal obstruction exists.

HOME HOSPITALS FOR TUBERCULOSIS.

(See opp. page.)

SOMETHING NEW IN HOSPITALS.

A Home for Convalescents, made possible by the munificence of the late John M. Burke, of New York, is about to be erected in White Plains, N. Y. For this purpose Mr. Burke left $4,500,000, and the trustees have just elected Dr. Frederic Brush, superintendent of the New York Post Graduate Hospital, as head of the new institution. The buildings will stand in a 60-acre tract on high ground, and there will be ample room for walks, drives and various prescribed athletic activities.

In Mr. Burke's deed of gift he made provision for the reception of sick children who are not proper subjects for any existing hospital, but who require careful attention in order to prevent more serious ailments. Provision was also made for supplying nurses at a moderate cost to families having sick cases requiring special treatment under the supervision of the attending physician.

Mr. Burke had carefully considered the conditions of charity work in European cities and had become impressed with the utter lack of provision in New York for the care of those who had been discharged from hospitals as cured. He discovered that homes for convalescents were part of the recognized charity scheme in many European cities, and that for almost a generation prominent charity workers in New York had tried to obtain the establishment of convalescent homes, but without success. Work will shortly commence on the buildings.

Puerperal Infection.

Physicians at the Boston City Hospital carry out the following method in treating puerperal infection:

The patient is kept out of doors on a wheel bed which can be moved into the ward whenever attentions of any kind are necessary. Sunlight seems to be quite as important as air, and, except in very hot weather, the patient is placed directly in the sun.

Iron and arsenic are valuable aids to sun and air in replacing hemoglobin. Strychnia is given as a stimulant to the vascular and nervous system. Alcohol increases the appetite and stays the loss of flesh in long-continued fever.

Fluids are supplied copiously by mouth, and in severe cases salt solution is given by rectum to increase the urinary secretion and aid the excretion of toxins. Alcohol and cold sponge baths are given for the pyrexia.

Hot or cold applications are used to relieve abdominal pain and distention.

Under this treatment rapid improvement is noted. The pallor disappears, appetite improves, flesh and strength increase and patients become deeply tanned. The effect on temperature is not immediate, but gradual, as the patient's resistance increases. The most striking results are seen in the prolonged pyrexias, where after several weeks of high temperature the general condition is wonderfully maintained.

Young and Williams of Boston have carefully studied the various lines of treatment followed in the Boston City Hospital (*Bost. Med. and Surg. Jour.*, March 14, 1912), and find that by adopting the method outlined above the mortality is reduced by nearly 20 per cent.

They summarize their findings in this manner:

This treatment probably exerts its action chiefly by increasing the amount of hemoglobin in the blood.

Sunlight is probably quite as important as fresh air.

Curettage is contra-indicated in puerperal infection, because it increases the mortality nearly 10 per cent.

A single intra-uterine douche of sterile salt solution should be the only local treatment, and some writers deny the value of even this.

Antistreptococcic serum and vaccines have not proved of much value.

The outdoor treatment is the most effective known at present for puerperal infections, but the search for new methods should be continued.

Death of Dr. Broughton.

Dr. Russell Broughton, of Rockford, Ill., the active head of one of the best known sanitariums in the country, died recently at the age of 69. He was graduated from Rush Medical College in 1869 and after many years in general practice, established the institution which bore his name. He speedily became widely recognized as a specialist of great ability in the treatment of nervous diseases and drug addictions. The sanitarium will be continued under the management of Dr. Broughton's assistant, Dr. G. A. Werrick.

An Anti-Serum for Cancer.

A new antiserum for cancer was recently reported by Berkeley and Beebe to the New York Academy of Medicine. In the paper, which was only a preliminary report (*Med. Rec.*, March 16), the authors give these findings:

1. By successive injections of a specific human cancer extract (the cancer being partially removed by operation) into an alien mammalian species it appears that a serum may be developed which, when injected intramuscularly, or better, intravenously, in increasing doses into the original host, is followed by rapid regression and disappearance of the remains of the tumor. This cannot be done with a normal alien serum. It is hard to explain the phenomenon except as a cytolysis of the tumor cells.

2. There is a strictly quantitative relation between the amount of serum used and the amount of tumor which may be made to disappear.

3. No ill effects have been so far observed from the injections of the serum (16 cases), except local swelling and the anaphylactic fever and vasomotor disturbances noted after giving an equal amount of normal foreign serum.

4. The relation of one antiserum ("stock serum") to histologically different cancers is variable and full of surprises. It will take years of labor to determine all the curious chemical affinities that may be involved.

5. Present clinical results are briefly as follows: Sixteen cases of malignant disease in all stages of advancement have been treated in the last nine months. A microscopical diagnosis was made in all but three cases. Fifteen were cancer and one was sarcoma. Nine received stock serum, one received autogenous serum after a secondary operation, six received autogenous serum after a primary operation. Of the nine patients receiving stock serum two were moribund when first seen, and died quite uninfluenced by the injections; another, having cancer of the esophagus, was remarkably benefited for several weeks; one, with an immense cancer of the tonsil, was somewhat benefited temporarily. One very extensive primary cancer of the bladder has not been recently heard from, but was probably not benefited. Of two immense cancers of the stomach, one was entirely unaffected, one slightly improved. One patient (breast case), after two months of injections, is nearly well and in excellent general condition. Another case (uterine cancer recurrent in the bladder) recovered promptly and has remained entirely well for four months. One far advanced breast case receiving a small amount of autogenous serum after a secondary operation, was greatly improved, but subsequently died of intercurrent acute disease. Of the patients receiving autogenous serum after a primary operation one is still under treatment, greatly improved; the others have had no recurrence within a period ranging from three to six months.

The present impression of the writers is that autogenous serum is much more effective than stock serum. It is believed that the great field of usefulness of the new serum will be to prevent the recurrence of malignant tumors removable in the early stages by operation.

There is no indication from present experience that large inoperable cancers and sarcomas will be amenable to the serum treatment. Treatment, to be effective, must be early if there is to be any reasonable quantitative relation between tumor and antibody. This report is hopeful and it is apparent that some of the many investigators in the cancer field will eventually discover a specific.

Great hopes are entertained that Ehrlich and Wassermann, working, as they are, in conjunction, will have a definite report of real progress in discovering a specific for human cancer, as they have for mouse cancer, before the end of 1912.

Raw believes that albumin test in sputum is valuable in certain doubtful cases, and when taken in conjunction with a positive Von Pirquet reaction would justify a diagnosis of pulmonary tuberculosis.

Diet, Hygiene and Nursing

BACTERIOLOGY.*

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New York.

Part II.

(*Continued from p. 89, March.*)

Ferments of Enzymes:

Most bacteria have the power of producing in their life process chemical substances called ferments or enzymes. These substances when thrown off from the living cell body have the power, even when present in the most minute quantities, of splitting up or decomposing complex organic compounds into simpler, more easily soluble and diffusible molecules. Thus by means of a bacterial ferment grape sugar is decomposed into alcohol and carbon dioxide. Ferments withstand moderate dry heat but are usually destroyed in watery solutions by temperatures over 70 degrees C. Acids, especially inorganic acids as hydrochloric, nitric or sulphuric, injure them, while they are resistant to all alkalies. You have an example of ferments in the peptonizing ferments you use to peptonize milk. You remember how heat destroys the action of such ferments. Similar substances are formed by bacteria.

Ptomains and Toxines:—

Ptomains are side products of decomposition caused by bacteria. Many of them are harmless, while a few are very poisonous. They are formed mostly in dead material, but also may be found in the living body, and if not made harmless by burning up with oxygen, may act as self poisons or leucomains.

Toxins are specific bacterial poisons. They are formed during the growth of the bacteria and may be given off during the life of the germ, as is the case with diphtheria and tetanus bacilli, or they may be retained by the germ until it dies, when the breaking up of the body sets free the toxin. So we see that ptomains are produced by the action of bacteria on dead organic substances while toxins are the product of the life processes of bacteria within themselves.

The knowledge of these substances is important, as in disease the destruction of bacteria alone may still leave the deleterious effects of enzymes, ptomains or toxins. Thus milk which has harbored a large number of certain bacteria, although boiled, may still seriously disturb the digestion of an infant on account of the poisons which the bacteria have produced.

The Use of Chemicals in the Destruction of Bacteria:—

The following degrees may be distinguished in estimating the destructive action of chemicals on bacteria, according to Park:

1. By attenuation the growth is not permanently interfered with, but the pathogenic (disease producing) and zymogenic (ferment producing) functions of the organism are diminished.

2. By antiseptic action organisms are not able to multiply, but they are not destroyed.

3. By incomplete sterilization the vegetative development of the organism is destroyed but the spores are are not.

4. By sterilization or disinfection vegetative and spore formation are destroyed.

Several conditions determine the power of a chemical agent to destroy bacteria.

1. The kind and the form of germ. Some germs are more easily destroyed than others, and the spore form is more resistant than the vegetative form.

2. Whether many or few bacteria are present.

3. The higher the temperature at which the exposure to a disinfectant is made, the greater the effect.

4. The strength of the solution.

5. The matter of the associated material. If a large amount of organic matter is present with the bacteria, the chemical agent may combine with the former before it can act on the

bacteria. This fact is important in disinfecting sputum and stools.

Disinfecting Properties of the More Commonly Used Disinfectants:—

Bichloride of Mercury:—1 part in 1,000,000 nutrient gelatin or bouillon prevents the development of parasitic bacteria. In water 1 part in 500,000 will kill many varieties in a few minutes. With organic substances its power is diminished so that 1 in 1,000 may be required. Most spores are destroyed within an hour when placed in 1 to 1,000 watery solution. We see, therefore, that the presence of organic material diminishes the efficiency of mercury as a disinfectant. The cause of this lies in the fact that mercury in alkaline fluids containing much albuminous substance forms insoluble compounds with the albuminous substances. Thus when mercury is brought in contact with a mass of fecal material, it forms an insoluble coat about the mass and thus prevents the disinfectant from penetrating further. Therefore, mercury is not a good disinfectant to use for disinfecting sputum or stools. The precipitation of the insoluble salt can be prevented by adding suitable quantities of sodium chloride (table salt) and ammonium chloride. The tablets of bichloride generally used have this combination for that reason. Solutions of 1 to 500 and 1 to 1,000 are sufficiently strong, when brought in contact with the bacteria, to kill the vegetative forms in fifteen minutes. When much organic matter is present stronger solutions must be used.

Nitrate of Silver:—In solution it has about one-quarter the value of bichloride of mercury as a disinfectant, but in inhibiting growth it has nearly the same value. In severe infections of the eye, as for instance gonorrhoeal, silver nitrate is used as a disinfectant for the conjunctiva.

Gaseous Disinfectants:—Sulphur, when burned, produces SO_2 gas. This gas is a much more active germicide in a moist than in a dry condition. An exposure for eight hours to an atmosphere containing at least four volumes per cent. of this gas in the presence of moisture will destroy most, if not all, of the pathogenic bacteria in their vegetative form. Four pounds of sulphur for each 1,000 cubic feet gives an excess of gas.

Peroxide of Hydrogen:—By virtue of its loosely combined oxygen, in a 20% solution will quickly destroy the pyogenic cocci and other spore free bacteria.

Chloride of Lime:—Depends on chlorine for its efficiency. A watery solution of 0.5 to 1% of chloride of lime will kill most bacteria in 1 to 5 minutes. A 5% solution usually destroys spores within an hour.

Organic Disinfectants:—

Alcohol:—10% strength of alcohol inhibits the growth of bacteria. Absolute alcohol (that is practically 100% alcohol) kills the vegetative forms of bacteria in from several to 24 hours.

Formaldehyde is a gaseous compound. Commercially it occurs in 40% solution. The most delicate silk, woollen, cotton, fur, and leather materials are unaffected in texture or color by formaldehyde. Only certain aniline colors as fuchsin and safranin are affected; but these need not be considered, as they are not used in fabrics on account of their liability to fade. Iron and steel are attacked after long exposure to the gas, but copper, brass, nickel, zinc, silver and gilt work are not acted upon. From these facts we see that formaldehyde is a very valuable disinfectant for dwelling places. It is also a good destroyer of odors. By experiment it has been found that in the air a 2.5% by volume of the aqueous solution or 10% by volume of the gas destroys fresh virulent cultures of the common pathogenic bacteria in a few minutes. Its action is more rapid and complete at higher temperatures and when the air is moist. Vegetative forms of bacteria are destroyed by a 2% watery solution of formalin within five minutes. Experimentally, formalin has been found to have half the strength of pure carbolic acid in effect on vegetative forms of bacteria.

Chloroform:—Even in 1% solutions chloroform destroys vegetative forms of bacteria. It is used to sterilize blood serum used for culture purposes, as it can be evaporated after it has had its effect.

Iodoform:—Has no appreciable destructive effect on most varieties of bacteria. It prevents decomposition and inhibits the growth of germs of putrefaction, and pus formation, but does not destroy them.

Aristol, a reddish brown powder, containing about 45% of iodin is used as a substitute for iodoform. It has a less disagreeable odor and is less poisonous.

Carbolic Acid:—One part in 1,000 inhibits the growth of bacteria; 1 to 100 kills all vegetative forms of bacteria. The less resistant spores are killed by a 5% solution within a few hours and the more resistant in from one to four weeks. Carbolic acid has the advantage over bichloride of mercury in that it does not form an insoluble compound with albumin when brought in contact with organic matter and is therefore more penetrating. Furthermore, it does not discolor instruments nor clothing as bichloride does, but it irritates and benumbs the skin when used in disinfecting hands. There are a number of disinfectants in common use that are made with cresol, the main ingredient of "crude carbolic acid." Among them are creolin and lysol. The former is used in 2% to 5% strength for cleansing hands and for irrigation. Lysol is used in surgery and gynecology in 1% to 5% strength; 2½ teaspoonfuls of either to a quart of water makes about a 1% solution.

Boracic acid, used in a saturated solution, is a mild, non-irritating and practically non-poisonous antiseptic. Thiersch's solution is a solution of boracic acid with salicylic acid added. It contains two parts of salicylic acid, 12 parts of boracic acid to 1,000 parts of hot water. It is a non-poisonous, non-irritating antiseptic of moderate power.

Potassium permanganate is an antiseptic, a disinfectant and a deodorant. It acts by parting with its contained oxygen and then becomes inert. It has a reddish purple color and then changes to brown when it has ceased acting. It has the disadvantage that it stains a brownish black color. It is used in solutions varying in strength from 1 to 100 to 1 to 10.

Practical Disinfection and Sterilization:—

Sunlight, pure air, and cleanliness are always very important agents for maintaining health and warding off disease. When we have to contend with accumulated filth or with contagious diseases, disinfection is necessary.

For simple cleansing a solution of one ounce of common soda in twelve quarts of hot soapsuds is sufficient. If a stronger and more efficient cleansing solution is required a half pound of common soda in three gallons of hot water will serve and also be feebly disinfectant. When it is necessary to prevent the spread of contagious diseases or to stop putrefaction, we have to use positive disinfectants. Boiling or steaming in closed vessels for one-half hour will absolutely destroy all disease germs. Furthermore, we may use any of the chemical disinfectants which we have before described.

Post-Graduate School for Nurses.

Something new in the line of education for nurses is promised by Dr. Walter R. Weiser, of Springfield, Mass. He is equipping a new hospital, which will be up-to-date in every particular, and a prominent feature will be a post graduate school for nurses. The superintendent of the institution is to be Miss Alice E. Pierson, superintendent of the Lincoln General hospital in New York and a graduate of the Presbyterian hospital of Philadelphia. She was formerly superintendent of nurses at the Allegheny General hospital in Pittsburgh.

The post graduate school will afford nurses the very latest ideas in nursing and Miss Pierson expects to make entrance to the school eagerly sought for.

The hospital will be one of the most complete in New England.

BROADEN THE NURSE'S OUTLOOK.

The plane of nursing must be raised if we are to attain the ideal, insists Miss Adelaide Nutting, director of the department of nursing and health in Teachers' College of Columbia University.

In the course of a recent address on the topic of Nursing and the Public Health, she said:

"To-day, in the very great majority of our training schools, the entire amount of time devoted to theoretical teaching during the whole three years of training (and three calendar years equal in actual time to four academic years) will be found about equal to one term or half year of ordinary high school work. And yet this feeble body of theory must cover the sciences and all those principles by which we stand or fall in our actual work.

"If we are to reconstruct our system of educating nurses to meet present demands, we must in our schools get far beyond the idea that practical efficiency is all that is needed to make a good nurse; we must set for her higher ideals. Do we seriously believe that we can develop in our students any real mental power in their work, or expect them to maintain high ideals in it while we require of them as students ten hours a day of hospital work (yet these hours exist in several hundred training schools—nearly 50 per cent. of the entire number in the country—and in many the hours are even longer); or while it can be truly recorded that nearly 25 per cent. of all training schools in this country still send their students out into families to act as nurses, and that remuneration for their services goes in almost all instances directly into hospital funds; that the great majority of training schools, probably not less than 90 per cent., have not in their staff one single paid instructor whose whole time is devoted to teaching students, while a pathetically large number do not own to having anything whatever in the way of a library for their students? Out of records received recently from over 800 schools, 299 either stated that they had no books or ignored the question on that subject. And in this whole country, where such enormous sums are given for general education, and for technical, agricultural, medical and other professional schools, there is not as far as we know one single training school provided by endowment or state aid for the proper conduct of its work. The hospital is left to struggle alone with an educational problem of which it can only adequately carry its due share. There are, of course, causes for these conditions. They should be intelligently and patiently studied. If we believe, as we say we do, that the work of the nurse is already of great and definite value; if we see, as some of us think we do, that it has potential values as yet but dimly apprehended; that it is destined to play an increasingly important part in the maintenance of public health and welfare, then the processes by which that nurse is made in training schools are clearly of vital importance, since any conditions which make them seem undesirable, unattractive or unintelligent, or place them at a disadvantage in essential methods and results in comparison with other educational processes, react finally upon the entire public, sick and well, hospitals and physicians first of all. I would urge, therefore, upon boards of trustees and governors of hospitals the paramount importance in the community of the educational system they have established, are guiding, and are under obligations to maintain, not merely as part of the hospital, with hospital efficiency and economy only in mind, but with wider outlook, as a part of the general educational system in which it should have an honored place.

"In the last analysis the great improvements in nursing must come from within; they must be brought about by nurses for nurses. If we honestly believe in our work and its value to our neighbors, we will count no sacrifice too great to make that it may be strengthened; we will serve it, and honor it; we will hold it high."

A New Army Nurse Superintendent.

Miss Isabel McIsaac, R. N., of Benton Harbor, Mich., has been appointed superintendent of the Army Nurse Corps by Surgeon General George H. Torney, U. S. A., to take the place of Miss Jane A. Delano, R. N., who has resigned to give her entire time to Red Cross work. Miss Delano has given the corps her best thought and as a result the personnel has been raised to a high point of efficiency. She has worked hard to have the nurse corps recognized in rank and no doubt this will eventually be brought about. Miss Delano has been assisting in Red Cross work for some time and she now believes her entire time should be given to the furtherance of its work.

Miss McIsaac has traveled over the country in the interests of nurses and is qualified in every way to take up the arduous labors of her new office.

Demineralized Food and Cancer.

Horace Packard (*Boston Medical and Surgical Journal*, March 21, 1912), in an article entitled "Demineralized Food and Cancer," expresses the belief that some other line of study of a broader and more comprehensive character than laboratory search for a cancer cell or a cancer microbe or a cancer toxin must be followed if we are to hope for prevention or cure of this scourge of the human race. He suggests that the demineralization of food products in our modern civilized life may have a bearing on this great question. Our meager knowledge of organic chemistry does not permit us to study fully the influence of the mineral elements of our food upon the ultimate cells of the body, but there can be no doubt that without them our organs could not exist and functionate. They are absolutely necessary to the highest degree and type of animal life and the maintenance of health and vigor and resistance to disease. An enormous amount of attention has been given in the past to the adjustment of nutrition in so far as it relates to proteins, carbohydrates and fats, but not much thought has been devoted to the rôle of the mineral food salts as elaborated by nature in the food vegetables. The author argues earnestly against the use of white bread, from which most of the mineral elements are removed in the process of making. Bread should be made from whole wheat flour. Potatoes should be baked and not pared and boiled, which results in the water appropriating the mineral constituents. Very valuable are well-cooked fresh vegetables, raw or cooked apples and fresh ripe fruits. Packard points out that cancer is most prevalent among the nations which have reached the highest type of civilization and least prevalent among those in tropical countries who represent the lower types and who subsist upon fruits and vegetables rich in the food salts, easily gathered and usually eaten without cooking, which facts coincide with his theory of cancer causation, for the demand of the civilized world is for bread which is white. No other article of food being in such universal and daily use among civilized nations as white flour bread Packard's theory appears plausible. It is a fact that the Scandinavian countries and Ireland lagged behind the other countries of Europe in their cancer percentages until they, too, began the universal use of bolted wheat flour for bread making. Packard has met with seeming success in the practical application of his theory in certain inoperable cases.

Anomalous Termination of Old Abscess.

J. F. Baldwin (*Lancet-Clinic*, January 27, 1912,) reports findings, which disclosed total obliteration of the gall bladder and common bile duct, the pus dissecting around the edge of the liver, penetrating the diaphragm and pointing in the right lung. There was no involvement of the liver tissue. Death occurred from cerebral embolism.

The Physician's Library

A Treatise on Tumors. By Arthur E. Hertzler, M. D., of Kansas City, Mo., Assistant Professor of Surgery in the University of Kansas. Octavo, 728 pages, with 538 illustrations and 8 plates. Cloth, $7.00 net; half Persian Morocco, gilt top, de luxe, $9.00 net. Philadelphia and New York: Lea & Febiger, 1912.

This is a pretentious work on a pretentious subject. It is fitting that a topic which takes up so large a part of our surgical literature should be treated as thoroughly as Hertzler has done. Realizing that existing treatises on tumors are either extra-clinical or extra-scientific, the author has found a happy mean. His work, based on a broad experience, is scientifically clinical or, we may better say, clinically scientific. It would be difficult to believe that the medically trained mind, after studying this text, would not possess an excellent conception of the subject of tumors. The book is, like Gaul, "divisa in partes tres." The parts are devoted to General Biology, Special Pathology, and Regional Consideration of Tumors. Hertzler follows fairly closely the tumor classification of Ribbert, classing into groups the connective-tissue, muscle-tissue, nerve-tissue, and epithelial-tissue types. He also gives as groups endotheliomas, cysts, teratomas and mixed tumors and combinations of tumors. This great variety is carefully treated under individual headings as to the etiology, physical charcteristics, constitutional effects, diagnosis, prognosis and treatment. These subjects are freely discussed, but as the book is intended more for the general practitioner of medicine than for the surgeon, no elaborate exposition of the detail of surgical technique is attempted.

Pellagra. By George M. Niles, M. D., Professor of Gastro-enterology and Therapeutics in the Atlanta School of Medicine, Atlanta, Ga. Octavo of 253 pages, illustrated. Cloth, $3.00 net. Philadelphia and London: W. B. Saunders Company, 1912.

This is the first complete American work on a disease which has attracted widespread attention during the past few years.

Niles erects his etiological structure upon Lombroso's theory that pellagra is an "intoxication produced by poisons developed in spoiled corn through the action of certain micro-organisms in themselves harmless to man." While the etiology of this disease is a mooted question, Niles' wide experience in its treatment gives his statements due authority, especially as he is physician to the only pellagra hospital in this country.

In discussing the treatment Niles touches upon the use by many diagnosticians of atoxyl, arsacetin, soamin, the transfusion of blood, pellagrous serum, as well as appendicostomy, colon irrigations and salvarsan injections. His own method is to observe strict dietetic and hygienic measures and give the proper kinds of baths as indicated. Medicinally he meets many of the symptoms as they arise and depends to a considerable extent upon hypodermatic injections of iron arsenite solution and sodium cacodylate. He uses internally Fowler's solution and potassium iodid.

Niles is prognostically optimistic, despite the fact that pellagra is, in a sense, "an unseen enemy," but he gives a guarded prognosis in cases complicated with fever, nervous or psychic symptoms, nephritis, tuberculosis, pneumonia and pregnancy.

Report of the International Plague Conference. Edited by Richard P. Strong, M. D., chief of the Biological Laboratory, Bureau of Science, Manila. Cloth, 500 pages. Illustrated. $3.50 net. Paper, $2.50 net. Published by the Bureau of Printing for the Bureau of Science, Manila, 1912.

The epidemic of pneumonic plague which raged in Manchuria and Northern China during the winter months of 1910-1911 caused the death of nearly 50,000 people. No epidemic of this magnitude and nature has occurred in modern times. When the epidemic assumed alarming proportions, the Chinese Government, actuated by the highest motives of humanity, invited the eleven foreign powers represented at Pekin to send specialists to attend an International Plague Conference for the purpose of throwing further light upon the nature of the disease and to give advice regarding methods for its prevention. Delegates were present from Austria-Hungary, China, France, Germany, Great Britain, Italy, Japan, Mexico, the Netherlands, Russia and the United States. Pneumonic plague took up most of the attention of the delegates, as it was with that form they were most interested. They carefully studied the epidemiology, bacteriology, pathology, diagnosis, prognosis and treatment, and found that the average duration of the disease was less than two days and no case lasted longer than one week.

Dr. Strong says, "No cases in which the bacteriological diagnosis was complete have been known to have recovered."

The report is the most complete treatise on pneumonic plague ever prepared, and is invaluable as a reference work.

Diseases of the Genito-Urinary Organs and the Kidney. By Robert H. Greene, M. D., Professor of Genito-Urinary Surgery at the Fordham University, New York; and Harlow Brooks, M. D., Assistant Professor of Clinical Medicine, University and Bellevue Hospital Medical School. Third Revised Edition. Octavo of 639 pages, 339 illustrations. Cloth, $5.00 net; Half Morocco, $6.50 net. Philadelphia and London: W. B. Saunders Company. 1912.

Of books on this subject there are many, but this one differs in that it is the conjoint work of a physician and surgeon, whereas other volumes have usually been written by surgeons alone. They have devoted their attention to both the medical and surgical aspects of genito-urinary diseases. The reference to gonorrhea is confined to a limited space, and syphilis is not discussed. While not essential, of course, the latter disease is usually looked for in such a work and readers expecting to find the disease elaborated upon, in view of Ehrlich's discoveries in the line of specific treatment, will be disappointed. The book is profusely illustrated with instructive half-tones and zinc etchings, and the typographical appearance is excellent. Clearness and simplicity are features of the work.

Home Hygiene and the Prevention of Disease. By Norman E. Ditman, M. D., 333 pages. Cloth, $1.50 net. New York: Duffield & Co., 1912.

As the people become more generally educated they take a livelier interest in matters which for centuries have been a closed book to the unprofessional mind. Physicians find that a comprehensive knowledge of medical things not a little knowlege) on the part of the laity is distinctly helpful. He can be certain of having his directions carried out more intelligently, and his words of advice will fall upon appreciative ears.

Dr. Ditman, realizing this, has set about to give "first aid" to those who are ill, and he has done it exceedingly well. Commencing with Abscess and concluding with Wry-neck, he has run the alphabetical gamut of disease, presenting in concise manner just what the ordinary family should know about disease conditions. The author, with a discretion rare in new writers, has so presented his subject that no physician can find fault with the contents. The intelligent housewife who will study this book can save her physician trouble and time by not summoning him for needless complaints. This is especially true of people living some distance from the physician.

Differential Diagnosis. Presented through an Analysis of 385 cases. By Richard C. Cabot, M. D., Assistant Professor of Clinical Medicine, Harvard Medical School. Octavo of 764 pages, illustrated. Cloth, $5.50 net. Philadelphia and London: W. B. Saunders Company, 1912.

Few books require three separate imprints from the first plates and then go into a second edition, revised and reprinted, in less than a year. But then there are few Cabots, and few men who know how to get down to the crux of cases in presenting them. The groupings in the book are ideal, the cases dealing with Pain, in various localities, Fevers, Chills, Coma, Convulsions, Weakness, Cough, Vomiting, Hematuria, Dyspnea,

Jaundice and Nervousness. Each heading has from 4 to 30 illustrative cases. Every case tells a complete story. Why cannot authors on other branches of medicine, notably surgery, psychiatry, ophthalmology and gynecology, adopt the same form? It is the easiest and best way to convey the necessary information to the reader.

Duodenal Ulcer. By B. G. A. Moynihan (London), F. R. C. S., Senior Assistant Surgeon at Leeds General Infirmary, England. Second edition, enlarged. Octavo of 486 pages, illustrated. Cloth, $5.00 net; Half Morocco, $6.50 net. Philadelphia and London: W. B. Saunders Company. 1912.

The first edition of D. Moynihan's book, which appeared two years ago, contained a report of 190 cases of operative duodenal ulcer. He enriches the literature upon this important subject in the second edition with an appendix in which he records 115 cases operated upon since his original work was tabulated. Duodenal ulcer alone was found in 87.8 per cent. and gastric and duodenal ulcers in 9.56 per cent. of the cases. Only one patient died, an anemic woman, who succumbed to cardiac failure on the thirteenth day. Before this woman's death Moynihan had performed 192 consecutive operations for duodenal ulcer without a fatality. Moynihan gives us the last word in the surgical treatment of ulcer of the duodenum, and his explanation of operative detail is very complete.

The Immediate Care of the Injured. By Albert S. Morrow, M. D., Adjunct Professor of Surgery in the New York Polyclinic. Second Edition, Revised. Octavo of 354 pages, with 242 illustrations. Cloth, $2.50 net. Philadelphia and London: W. B. Saunders Company, 1912.

Dr. Morrow has performed a real service to humanity in presenting this book. Very many present day volumes offer little that is especially helpful, but this is different. It is intended for the use of the laity, in instructing the non-medical person how to properly act in times of emergency until the physician reaches the scene. The anatomy and physiology of the body are united into an altogether interesting story. After explaining the devious paths of bandaging, dressing and practical medication, such topics as hemorrhage, burns, fractures, dislocations, asphyxia and poisoning are plainly and understandingly discussed. It would be well if this book were mastered by all intelligent laymen. Many lives are saved by first aid, administered by the casual passer-by.

Sex Hygiene for the Male. By George F. Lydston, M. D., Professor of Surgical Diseases of the Genito-Urinary Organs in the University of Illinois. 300 pages, 24 engravings. Cloth. Chicago: The Riverton Press, 1912.

Every parent, every teacher and every student of and believer in eugenics should carefully read this book. The dangers that beset boys and young men are innumerable, and many of those who yield to temptation do so because of lack of instruction from their guardians. There is a natural delicacy on the part of the parent in discussing sexual hygiene with his son, but this book makes one's duty obvious, and the method easy. It treats on various sexual diseases and also how to build a firm physical structure by means of gymnastics.

The book is hardly proper for young men, but is invaluable to adults.

Who's Who in Science. Edited by H. H. Stephenson. 321 pages. Cloth, $2.00 net. New York: The Macmillan Co., 1912.

This is a classified index of the world's leaders in science. Medically, brief autobiographies are given of some of the leading authorities in anatomy, chemistry, medicine, surgery, pathology, bacteriology and physiology in Europe and America. The list is far from complete, as the omission of such men as Ehrlich and Wassermann, Czerny, Tuffier and Broca would signify, while some of those mentioned are hardly of more than local reputation.

BOOKS RECEIVED.

All books received will be acknowledged in this column.

Surgical Operations. By Prof. Friedrich Pels-Lensden of Berlin. Translated by Faxton E. Gardner, M. D., of New York. 757 pages, 668 illustrations. Cloth, $7.00 net. Published by Rebman, New York.

Ophthalmology. By Dr. Paul Roemer, of Greifswald. Translated by Dr. M. L. Foster of New York. 275 pages, 186 illustrations. Cloth, $2.50 net. Published by Rebman Company, New York.

Sex Hygiene. By G. F. Lydston, M. D., of Chicago. 300 pages, 24 illustrations. Cloth, $2.25 net. Published by The Riverton Press, Chicago.

Physiology of the Semi-Circular Canals and their Relation to Seasickness. By Joseph Byrne, M. D., of New York. 569 Pages. Cloth. Published by J. T. Dougherty, New York.

Home Hygiene and Prevention of Diseases. By Norman E. Ditman, M. D., of New York. 333 pages. Cloth, $1.50 net. Published by Duffield & Co., New York.

Pellagra. By George M. Niles, M. D., of Atlanta. 253 pages, illustrated. Cloth, $3.00 net. Published by W. B. Saunders Company, Philadelphia.

A Mother's Guide. By Francis Tweddell, M. D., of New York. 182 pages. Cloth, $1.00 net. Published by James T. Dougherty, New York.

Merck's Manual of the Materia Medica, 493 pages. Published by Merck & Co., New York.

Who's Who in Science. Edited by H. H. Stephenson. 323 pages. Cloth, $2.00 net. Published by MacMillan Company, New York.

Modern Urinology. By Clifford Mitchell, M. D., of Chicago. 636 pages, illustrated. Cloth, $3.00 net. Published by Boericke & Tafel, Philadelphia.

Differential Diagnosis. By Richard C. Cabot, M. D., of Boston. 764 pages, illustrated. Cloth, $5.50 net. Published by W. B. Saunders Company, Philadelphia.

Treatment of Shortsight. By Prof. D. J. Hirschberg, of Berlin; Translated by G. L. Johnson, M. D. 120 pages, illustrated. Cloth, $1.00 net. Published by Rebman Company, New York.

Spondylotherapy. By Albert Abrams, M. D., F. R. M. S., of San Francisco. 660 pages, illustrated. Cloth. Third Edition. Published by Philopolis Press, San Francisco, Cal.

The Tragedy of Coriolanus. By William Shakespeare. Edited by Stuart P. Sherman, Ph. D., Professor of English in the University of Illinois. 191 pages, with copious notes. Cloth, 85 cents net. Published by The MacMillan Company, New York.

Annual Report of the Middletown State Homeopathic Hospital for 1911, by the Board of Managers. Paper. Published by J. B. Lyons Co., State Printers, Albany, N. Y.

Annual Report of the United States Public Health and Marine Hospital Service. Cloth. 331 pages. Published by the Government Printing Office, Washington, D. C.

Progressive Medicine. Edited by H. A. Hare, M. D., and L. F., Appleman, M. D., Vol. XIV, No. 1. Paper. 377 pages, $1.50 net. Published by Lea & Febiger, Philadelphia.

Milk and the Public Health. By William G. Savage, M. D., of Somerset, England. Cloth, 459 pages, $3.25 net. Published by The MacMillan Company, New York and London.

Food for the Invalid and Convalescent. By Winifred S. Gibbs, of New York. Cloth, 81 pages, 75 cents net. Published by The MacMillan Company, New York and London.

Immunity. By Dr. Charles Citron, of the University of Berlin. Illustrated by A. L. Garbat, M. D., of the German Hospital, New York. Cloth, 200 pages, illustrated, $3.00 net. Published by P. Blakiston's Son & So., Philadelphia.

A Cyclopedia of American Medical Biography from 1610 to 1910. By Howard A. Kelly, M. D., of Johns Hopkins University, Baltimore. In two volumes of 550 pages each, illustrated. Cloth, per set, $10; half morocco, $13. Published by W. B. Saunders Company, Philadelphia and London.

W. J. Mayo says: "Cancer of the breast is recognized as wholly within the domain of surgery, yet the cancer quack, with his plaster, cures an occasional case. Cancer of the stomach does not have even the remote chance of the quack's occasional cure. When brought face to face with the fact that cancer exists in the stomach, the apathy of the medical profession is only equaled by that of the patient. To merely diagnose cancer of the stomach is enough to satisfy the patient, the family, and the friends." Mayo says operative results are as good in cancer of the stomach, when taken early, as those for cancer in any other part of the body.